PROPHET
REV2
8/16-Voice Polyphonic Synthesizer

Dave Smith

I N S T R U M E N T S

PROPHET
REV2

User's Guide

Version 1.0
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Tested to Comply
With FCC Standards
FOR HOME OR OFFICE USE

$C\,\epsilon$

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A Few Words of Thanks

Thank you for purchasing the Prophet Rev2, the successor to our popular Prophet '08 synthesizer, which has been a workhorse in the music industry for nearly 10 years. As enduringly popular as the Prophet '08 has been, we felt it was time to update it with new technology and new features.

To that end, we designed the Prophet Rev2 by enhancing and improving everything we could about the original Prophet '08 and, in many cases, doubling its power. We took the classic sound of the Prophet '08's DCO and Curtis-filter-based voice and added powerful new features that the original never had, such as wave-shape modulation, digital effects, an expanded modulation matrix, a polyphonic step sequencer (in addition to its original gated step sequencer), a more intuitive user interface, USB connectivity, and more. The result is a modern classic revisited.

Creating the Prophet Rev2 has been a very satisfying adventure in making a good synth even better. Create some great sounds with it!

Cheers,

Dave Smith

Getting Started

The Prophet Rev2 is a 8/16-voice polyphonic synthesizer with analog oscillators, filters, and amplifiers. The majority of its sound-shaping controls are located on its front panel, putting a tremendous amount of power and versatility within easy reach.

This chapter of your user's guide provides a brief overview of the Rev2, including such essential tasks as how to edit and save sounds. Later sections of this manual explain each of the Prophet Rev2's parameters.

Don't hesitate to dive right in and start turning knobs and pressing buttons before you begin reading. Start exploring and let your ears guide you!
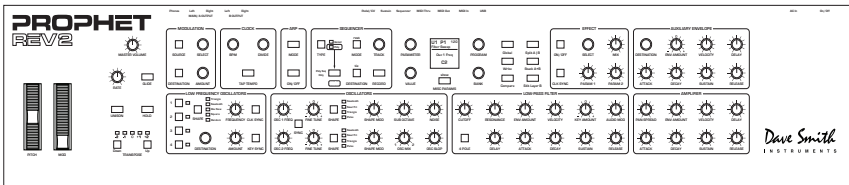
Prophet Rev2 front panel

Sound Banks

The Prophet Rev2 contains a total of 1024 programs. Banks U1-U4 are user banks that can be overwritten. Banks F1-F4 are factory banks that are permanent. As shipped, user banks U1-U4 are identical to permanent factory banks F1-F4. Each bank has 128 programs (x 4 banks = 512 programs each). You can edit the programs of either bank, but you can only save them to user banks U1-U4.

Why do we include banks of non-rewritable permanent sounds? So that they are always available, to be used as is, or as templates for new sounds of your own. It's easy to design a new sound by tweaking an existing one.

```
┌─────────────────────┐
│ U1  P1      120      │
│ Filter Sweep         │
│                      │        ◯
│   Osc 1 Freq         │     PROGRAM
│      C2              │
└─────────────────────┘
         show                   ◯
        ┌────┐               BANK
        └────┘
      MISC PARAMS
```
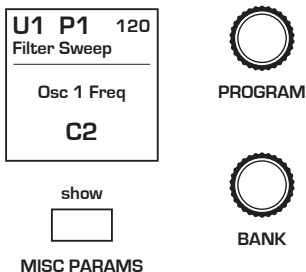
Program and Bank controls

Selecting Programs

Use the BANK and PROGRAM knobs to select and recall programs.

To choose a program:

1. Turn the BANK knob to select the bank you want.

2. Turn the PROGRAM knob to select a program within that bank.

Editing Programs

Because the majority of the sound-shaping controls of the Prophet Rev2 appear on its front panel, editing an existing program is simple: just turn a knob and listen to its effect. Keep turning knobs and pressing buttons. If you like what you've created, save the program. (See "Saving a Program" on page 4.)

The rotary controls on the front panel are a mixture of "endless" rotary encoders (which have no position indicator) and potentiometers or "pots," which have a position indicator and a finite travel range from left to right. You can choose between three different modes that determine how the synth reacts when you edit its parameters with a pot. For details, see "Pot Mode" on page 16.

Comparing an Edited Program to its Original State

When editing a program, it is often useful to compare its edited state to its original state to evaluate your edits. Alternatively, before saving a program to a new location you may want to check the program in the target location before you overwrite it.

To compare an edited program to a saved version:

1. Edit a program.

2. Press the COMPARE button. It lights up, indicating compare mode.

3. Play the keyboard to hear the saved version of the sound.

4. To disable the compare function and return to the edited sound, press the COMPARE button again to turn it off. Programs can't be written while in compare mode.

It's also useful to be able to check the value of a parameter for reference. Normally, to make a parameter value appear in the display, you have to turn the parameter's knob — which will change the parameter value. But there is a way to do this without changing the value:

To check the value of a parameter without changing it:

1. Press and hold the MISC PARAMETER button.

2. Turn any parameter knob. The value appears in the display.

3. To check additional parameter values, continue holding down the MISC PARAMETER button and turn other knobs to check their value.

Creating a Program from Scratch

An existing program can be very useful as a jumping off point for new sounds. But it's also useful (and educational) to create a new sound from scratch. The Prophet Rev2 makes this easy by providing a "basic preset" that you can quickly recall at any time. This preset is very simple, with a single oscillator as its basis.

To recall the basic preset:

• In the TRANSPOSE section, press and hold the DOWN and UP buttons simultaneously, then press the HOLD button.

To recall the basic preset using the Global Menu:

1. Press the GLOBAL button.

2. Use the PARAMETER knob to select BASIC PROGRAM.

3. Press the WRITE button.

Saving a Program

If you've created a sound that you like, you'll probably want to save it. Saving a program overwrites a previously saved program. Sound designers often save many incremental versions of a program as they continue to refine it. These intermediate versions often make good jumping off points for new sounds.

To save a program to the same preset location:

1. Press the WRITE button. Its LED begins blinking.

2. Press the WRITE button again. Its LED stops blinking and the program is saved.

To save a program to a different location:

1. Press the WRITE button. Its LED begins blinking.

2. Turn the BANK or PROGRAM knobs to select a new location. You can only save to banks U1-U4.

3. Press the WRITE button again. Its LED stops blinking and the program is saved.

Saving a program saves any edits to programs on both Layer A and Layer B.

Canceling Save

Sometimes you may want to cancel saving a program before you commit.

To cancel the save process before you commit:

- If the WRITE button LED is flashing, press the GLOBAL button. The WRITE LED stops flashing and saving is canceled. You can return to editing if you want.

Comparing Before You Save

Before saving a program to a new location, it's a good idea to listen to the program in the target location to make sure you really want to overwrite it.

To evaluate a program before you overwrite it:

1. Get ready to save by pressing the WRITE button. It starts flashing.

2. Press the COMPARE button. Its LED lights up.

3. Use the BANK and PROGRAM knobs to navigate to the sound you want to compare and play the keyboard to hear the sound.

4. To disable the compare function and go back to the edited sound, press the compare button again to turn it off. (Programs can't be written while in compare mode.)

5. If you want to save the edited sound, the WRITE button is still flashing and ready to save, so navigate to a location with the BANK and PROGRAM knobs and press WRITE. The sound is saved.

6. Alternatively, if you want to cancel saving and continue editing, press the GLOBAL button. Saving is canceled.

Naming a Program

You can rename a program when the WRITE command is active.

To rename a program:

1. Press the WRITE button. Its LED begins blinking.

2. Turn the PARAMETER knob to move the cursor forward or backward

3. Turn the VALUE knob to select a character.

4. When you're done naming the program, press the WRITE button again. Its LED stops blinking and the program is saved.

Working with Stacked or Split Programs

The Prophet Rev2 is bi-timbral, meaning that it can produce two different sounds/programs at the same time, either by stacking them, or by allowing you to split the keyboard and assign one sound to the upper section of the keyboard and a different sound to the lower section of the keyboard.

The two layers are referred to as Layer A and Layer B. By default, Layer A is always active when you recall a program. If either the SPLIT A|B button or the STACK A+B button is lit, then Layer B is also active.

Each Layer can have different Effect, Unison, Arpeggiator, and Sequencer settings. This allows for some very interesting combinations of sounds.

As you scroll through various factory programs, you can tell which are stacked and which are split. On stacked sounds, the STACK A+B button is lit. On split sounds, the SPLIT A|B button is lit.

All factory programs have a "B" layer, even if that layer isn't currently enabled. To hear Layer B in isolation, press the EDIT LAYER B button and disable stack or split (if active) by turning off the STACK A+B btutton or SPLIT A|B button. Pressing EDIT LAYER B a second time enables Layer A again.

Button is lit when split is active

PROGRAM

Global

Split A | B

Button is lit when stack is active

Write

Stack A+B

Press to enable Layer B editing

BANK

Compare

Edit Layer B
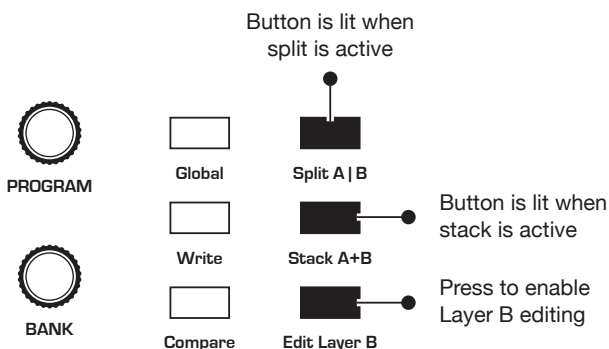
Split and Stack buttons

Stacked Programs

Stacking two programs allows you to create extra fat sounds, since you can have two completely different programs layered on top of each other. Polyphony is halved in Stack mode, so if you have a 16-voice Prophet Rev2, in Stack mode, it functions as an 8-voice because it uses two voices for each key played.

To turn Stack mode on:

- If it's not currently lit, press the STACK A+B button. The button becomes lit. The program on Layer B is stacked with the program on Layer A. Polyphony is halved since two voices are used per note.

To turn Stack off:

- If it's currently lit, press the STACK A+B button. The button becomes unlit. Only the program on Layer A is heard.

To edit Layer B:

1. Press the EDIT LAYER B button. Layer B editing is enabled.

2. Change any parameters to change the sound of Layer B.

3. Press the EDIT LAYER B button again to turn off Layer B editing.

To edit Layer A and B simultaneously:

1. With Stack mode on (STACK A+B button is lit) press and hold the EDIT LAYER B button. It begins flashing, indicating that you are in "Link" mode.

2. Change any parameters. The parameters are changed on both Layer A and Layer B.

3. To turn off Link mode, press the EDIT LAYER B button again. It stops flashing.

Saving a program saves any edits to programs on both Layer A and Layer B.

To copy Layer A to Layer B:

1. Press both the SPLIT A|B button and the STACK A+B button simultaneously.

2. Turn the PARAMETER knob and select COPY LAYER A TO B.

3. Press the WRITE button. Layer A is copied to Layer B.

To copy Layer B to Layer A:

1. Press both the SPLIT A|B button and the STACK A+B button simultaneously.

2. Turn the PARAMETER knob and select COPY LAYER B TO A.

3. Press the WRITE button. Layer B is copied to Layer A.

To swap Layer A and Layer B:

1. Press both the SPLIT A|B button and the STACK A+B button simultaneously.

2. Turn the PARAMETER knob and select SWAP A AND B.

3. Press the WRITE button. Layer A and B are swapped.

Split Programs

In split mode, playing a key on the left side of the keyboard will play the Layer A sound and playing a key on the right side will play the Layer B sound. Polyphony is allocated equally between the two sounds, with half of the available voices on Layer A and half on Layer B.

The specific key that starts the Layer B sound is called the *split point*, and is saved with the program.

All factory programs have a "B" layer, even if that layer isn't currently enabled.

To turn Split on:

• If it's not currently lit, press the SPLIT A|B button. The button becomes lit. The left side of the keyboard plays the Layer A sound and the right side of the keyboard plays the Layer B sound.

To turn Split off:

• If it's currently lit, press the SPLIT A|B button. The button becomes unlit. Only the program on Layer A is heard across the full range of the keyboard.

To set the split point:

1. Make sure the SPLIT A|B button is lit.

2. Press and hold the SPLIT A|B button and press a key on the keyboard. This sets the start point for Layer B.

3. Release the SPLIT A|B button.

To swap Layer A and Layer B sounds:

1. Press both the SPLIT A|B button and the STACK A+B button simultaneously.

2. Turn the PARAMETER knob and select SWAP A AND B.

3. Press the WRITE button. Layer A and B are swapped.

Moving to the Next Level

Before you start exploring the sound creation capabilities of the Prophet Rev2 we'd like to point you toward a few things that will help you tailor the instrument to your needs.

First, check out the *Global Settings* section of this manual. Read about Pot Modes and determine which works best for you when you're editing sounds. You'll also find information about MIDI setup. Read this to more effectively integrate the Prophet Rev2 into your MIDI rig. To get the most out of the Prophet Rev2's live performance capabilities, read up on using a footswitch or expression pedal.

And finally, be on the lookout for tips and notes scattered throughout this manual to gain a better working knowledge of the Prophet Rev2. The better you know it, the more you'll get out of it. We wish you many hours of musical exploration!

Connections
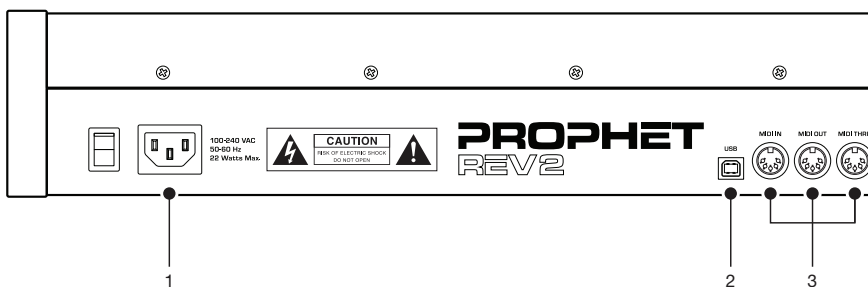
1. AC Power Connector—Accepts a standard, grounded IEC power cord. Operates over a range of 100 to 240 volts and 50 to 60 Hz.

2. USB—For bidirectional MIDI communication with a computer. The Prophet Rev2 is a Class Compliant USB device and does not require additional drivers when used with Mac OS or Windows. See *Using USB* on page 67 for more information.

3. MIDI In, Out, and Thru—Standard 5-pin MIDI DIN connectors.

4. Sequencer—Accepts a momentary, normally open or normally closed footswitch to turn the sequencer or arpeggiator on and off. Alternatively, an audio signal connected to this jack can be used to either control sequencer/ arpeggiator playback, or to gate the filter and amplifier envelopes while notes are held. See Pedal/CV on page 13 for more information about choosing the appropriate mode for these behaviors.

> Audio signals used to drive the arpeggiator/sequencer should not exceed 5 volts peak-to-peak.

5. Sustain—Accepts a momentary, normally open or normally closed footswitch to control sustain.
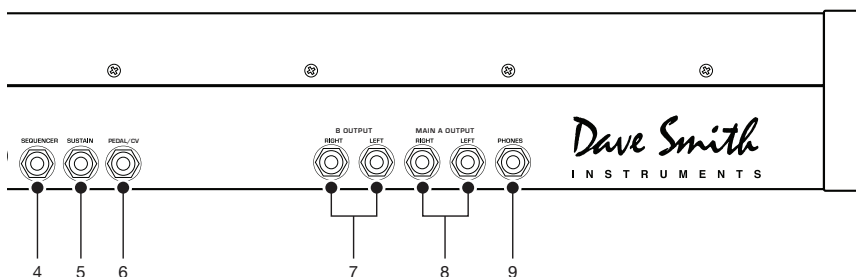
6. Pedal/CV—Accepts a standard expression pedal that has a variable resistor on a TRS (tip-ring-sleeve) ¼ inch phone plug. Once connected, you can use the modulation matrix to route the pedal to control a variety of things such as volume or filter cutoff frequency to add expressiveness to live performance.

7. B Audio Outputs—Unbalanced, ¼ inch audio outputs. Connect audio cables to these jacks if you want separate stereo outputs for Layer B. If no cables are connected, Layer B is output on the Main A Outputs.

8. Main/ A Audio Outputs—Unbalanced, ¼ inch audio outputs. These are the main stereo outputs for the synth. They carry Layer A and also Layer B if no cables are connected to the "B Audio Outputs" jacks.

9. Headphones—A ¼ inch stereo headphone jack. Headphone volume is controlled by the MASTER VOLUME knob on the front panel.

Global Settings

Press the GLOBAL button and use the PARAMETER and VALUE knobs to scroll through and set parameters such as Master Tune and MIDI Channel that affect all programs globally.

1. Master Coarse Tune: -12…+12—Master Transpose control, 0 is centered. Steps in semitones up to one octave up (+12) or down (-12).

2. Master Fine Tune: -50…+50—Master Fine Tune control; 0 centered. Steps in cents as much as a quarter-tone up (+50) or down (-50).

3. MIDI Channel: All, 1…16—Selects which MIDI channel to send and receive data, 1 to 16. Choosing ALL receives on all 16 channels.

4. MIDI Clock Mode: Sets the synthesizer's ability to send and receive MIDI clock messages:

- Off: MIDI Clock is neither sent nor received
- Master: MIDI Clock is sent, but not received.
- Slave: MIDI Clock is received, but not sent.
- Slave Thru: MIDI Clock is received and passed to MIDI Out
- Slave No S/S (no start and stop): Receives MIDI Clock but does not respond to MIDI Start or Stop command.

In Slave and Slave Thru modes, if no MIDI clock is present at the selected input, the arpeggiator and sequencer will not function.

5. MIDI Clock Cable: MIDI Port, USB—Sets the port, MIDI or USB, by which MIDI clocks are received.

6. MIDI Param Send: Off, CC, NRPN—Changes to the values of front panel controls are transmitted via MIDI as Non-registered Parameter Number (NRPN) controllers or as Continuous Controllers (CC). Transmission of parameters can also be turned off. See *MIDI Implementation* on page 79 for details.

NRPNs are the preferred method of parameter transmission, since they cover the complete range of all parameters, while CCs are limited to a range of 128.

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7. MIDI Param Receive: Off, CC, NRPN—Sets the method by which parameter changes are received via MIDI. As with transmission, NRPNs are the preferred method.

8. MIDI Control Enable: Off, On—When On, the synth will respond to MIDI controllers, including Pitch Wheel, Mod Wheel, Pedal, Breath, Volume, and Expression.

9. MIDI Program Enable: Off, On—When On, the synth will respond to received MIDI Program Change and other SysEx messages, and will transmit them (when prompted) to the MIDI Out. See *Sysex Messages* on page 90 for details.

10. MIDI Sysex Cable: None, MIDI Port, USB—Sets the port, MIDI or USB, by which System Exclusive data will be transmitted and received.

11. MIDI Out Select: Off, MIDI, USB, MIDI+USB—Sets the port by which MIDI data will be transmitted.

12. Multi Mode: On, Off—Multi Mode allows separate MIDI control of voices 1-8 and voices 9-16 on 16-voice systems. (On 8-voice systems this is voices 1-4 and voices 5-8.) This enables independent, bi-timbral control of the Prophet Rev2.

When Multi Mode is on, the Prophet Rev2 responds to MIDI data on two consecutive MIDI channels — the base channel (selected in the Global menu) and the next highest channel. The base channel controls voices 1-8 (or 1-4 on 8-voice systems) and the other channel controls voices 9-16 (or 5-8 on 8-voice systems). Notes, program changes, and other MIDI data received on the specified channels provide independent control of the two parts.

Note that a program change needs to be sent to each of the two channels when setting up Multi Mode. Only Layer A of the selected program is loaded. There are no stacks or splits in Multi Mode. Use CCs or Layer A NRPNs for automation of parameters. Program Layer B data is completely ignored in Multi Mode

13. Local Control: Off, On—When on (the default), the keyboard and front panel controls directly affect the Prophet Rev2. When off, the controls are transmitted via MIDI but do not directly affect the "local" synth (that is, the Prophet Rev2). This is primarily useful for avoiding MIDI data loops that can occur with some external sequencers.

14. Velocity Curve: Curve 1... Curve 8—Sets one of the eight velocity curves for the keyboard to adjust the velocity response to your playing style.

15. Pressure Curve: Curve 1, Curve 2, Curve 3, Curve 4—Sets one of four pressure curves for the keyboard to adjust the aftertouch to your playing style.

16. Mono/Stereo: Stereo, Mono—The Prophet Rev2 defaults to stereo operation. When set to Mono, this parameter defeats all pan settings and modulation, effectively making each of the outputs a mono output.

17. Pot Mode: Relative, Passthru, Jump—The rotary controls on the Prophet Rev2's front panel are a mixture of "endless" rotary encoders and potentiometers or "pots." The pots are identifiable by their lined knobs and the fact that they have about 300° of travel. There are three pot modes to determine how the synth reacts when the programmable parameters are edited. (Master volume is not programmable, so these modes don't apply.)

When set to RELATIVE, changes are relative to the stored setting. In Relative mode, the full value range is not available until either the minimum or maximum value and the respective lower or upper limit of the pot's travel is reached.

For example, the Resonance parameter has a value range of 0 to 127. Let's say the physical position of the Resonance pot is the equivalent of a value of 100. If you switch to a program that has a stored Resonance setting of 63 and turn the pot all the way up, it will only go to 90. To get to the maximum value of 127, you first have to turn down until the value is at the other extreme and the pot is at the limit of its travel (in this case, 0 and fully counter-clockwise, respectively).

In Passthru mode, turning the pot has no effect until after the edited value equals the preset value (that is, until the edited value "passes through" the stored value).

Jump mode uses an absolute value based upon the position of the pot when edited: turn a pot and the value jumps immediately from the stored value to the edited value.

18. Alt Tuning: Equal Temperment, 1…17—Selects one of the Prophet Rev2's built-in tunings. Set to 1. EQUAL TEMPERMENT, the tuning is standard, chromatic tuning. Choosing 2 through 16 selects an alternative, non-chromatic, non-Western scale that can be used to emulate ethnic instruments or in other creative ways.

See *Appendix A: Alternative Tunings* on page 71 for a description of each tuning. Additional tunings can be imported as a SysEx message. For more information, see Appendix A.

19. Screen Saver: On, Off—The Prophet Rev2 display has a built-in screen saver that puts it to sleep when not in use. This features is designed to prolong the life of the display and we recommend using it. If, however, you want to disable this feature you can do so by setting it to *Off*.

20. Seq Pedal Mode: Normal, Trigger, Gate, T-G—Selects the mode for signals received on the rear-panel SEQUENCER jack.

- With NORMAL selected, a footswitch will start sequencer playback.

- With TRIG selected, an audio signal connected to the SEQUENCER jack will step the sequencer when the sequencer's PLAY button is on.

- With GATE selected, an audio signal connected to the SEQUENCER jack will trigger and gate the envelopes while you hold a note or chord. Additionally, turning on the sequencer or arpeggiator will add sequencer or arpeggiator playback — but controlled by the Prophet Rev2's clock BPM and VALUE settings and not the audio trigger.

- With T-G (TRIGGER+GATE) selected, an audio signal connected to the SEQUENCER jack will trigger and gate the envelopes while you hold a note or chord. Additionally, pressing the sequencer's PLAY button will also add synchronized sequencer playback.

21. Pedal Polarity: Normal, Reversed—There are two types of momentary footswitches, normally open and normally closed. Either type can be used with the Sustain switch input. This setting allows you to accommodate both models in case yours behaves in a way that is the opposite of what you expect due to its polarity. (Sustain is on until the footswitch

is pressed and then it turns off, which is the opposite of the expected behavior.) Connect your pedal and choose the appropriate setting based on its behavior.

22. Sustain Arp: Arp hold, Sustain—Sets the function for the Sustain pedal input the rear of the synthesizer. Selecting ARP HOLD and pressing the sustain pedal causes the arpeggiator to hold the current arpeggio as if you had pressed the hold button on the front panel. Selecting SUSTAIN chooses normal sustain pedal operation.

23. Calibrate Wheels—Calibrates the Pitch and Mod wheels.

24. Basic Program—Loads a basic, template program.

25. Calibrate—Calibrates the oscillators and filters. You shouldn't need to do this under normal circumstances since the filters are calibrated at the factory and generally don't require re-calibration or re-tuning.

26. Reset Globals—Sets the global parameters to the factory default settings.

27. Dump Program—Transmits the current program in SysEx format via the selected MIDI port. Dumped programs will load back into the same location in memory when imported back into the synth via MIDI.

28. Dump Bank—Transmits the current bank in SysEx format via the selected MIDI port. (See item 10, "MIDI Sysex Cable.") Dumped banks will load back into the same location in memory when imported back into the synth via MIDI.

29. Dump All Banks—Transmits all four User Banks in SysEx format via the selected MIDI port. (See item 10, "MIDI Sysex Cable.") Dumped banks will load back into the same location in memory when imported back into the synth via MIDI.

Oscillators

Oscillators provide the raw building blocks of the Prophet Rev2's sound by producing *waveforms*, each of which has its own inherent sound character based on its harmonic content. The Prophet Rev2 has two oscillators, plus a sub oscillator and a noise generator, per voice.

Oscillator 1 and 2 are capable of generating sawtooth, sawtooth + triangle, triangle, and pulse waves. You can vary the width of any of these waveshapes using the SHAPE MOD parameter. This provides a great variety of different waveshapes and timbres.

The oscillators on the Prophet Rev2 are extremely stable. To emulate the random pitch drift and oscillator instability of vintage instruments, use the osc SLOP parameter to dial in as little or as much drift as you like.
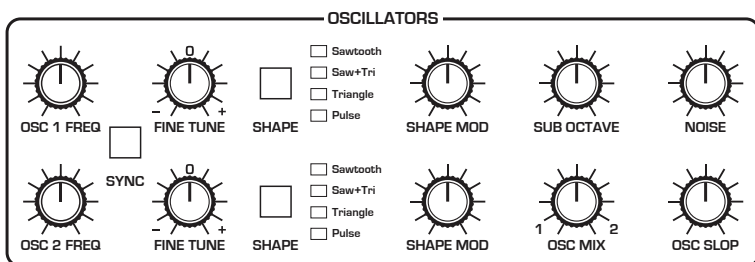
The Oscillator section

Oscillator 1 can be hard-synced to Oscillator 2 for harmonically-complex sounds when modulated. Both oscillators feature a FINE TUNE knob for detuning and thickening sounds.

You can force either or both of the oscillators to start its wave cycle from its beginning (its zero crossing) each time you press a note on the keyboard by setting NOTE RESET to ON in the MISC PARAMETERS menu. This is can be useful for creating sounds that have a very consistent sound each time you trigger them.

Oscillator Parameters

Osc Freq: Sets the base frequency of Oscillator 1 or 2 over a 9-octave range from 16 Hz to 8KHz (when used with the Transpose buttons). Adjustment is in semitones.

> The global MASTER COARSE and MASTER FINE settings affect the pitch of the oscillators. See "Global Settings" on page page 14 for more information.

Fine Tune: Fine tune control with a range of a quartertone up or down. The 12 o'clock position is centered. Steps are in cents (50 cents = 1/2 semitone).

Shape: Sawtooth, Sawtooth + Triangle, Triangle, Pulse —This button selects the waveshape generated by the oscillator. You can also turn the oscillator off by selecting no waveshape.

Shape Mod: Changes the "pulse" width of the selected waveform, which modifies its harmonic content and timbre. To generate a square wave when PULSE is selected as the waveform, set this parameter to 50.

> Applying waveshape modulation using a low frequency oscillator or other modulation source in the mod matrix is a great way to add movement and thickness to a sound.

Sync: Off, On—Turns Oscillator 1 hard sync on. Sync forces Oscillator 1 (the slave) to restart its cycle every time Oscillator 2 (the master) starts a cycle. This provides a way to create more complex, harmonically rich shapes from simple waveforms—especially when the frequency of Oscillator 1 is set to a different interval than Oscillator 2.

Oscillator 1

Oscillator 2

Oscillator 1 synced to Oscillator 2
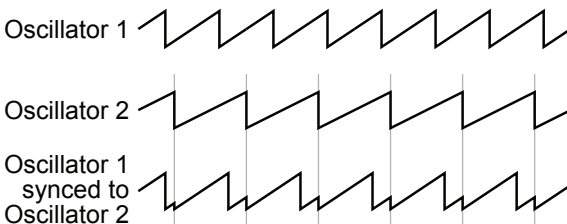
Oscillator hard sync

Try using the auxiliary envelope to sweep the pitch of Oscillator 1 when it is synced to generate the classic, hard-edged sync sound.

Sub Octave: 0…127—Controls the level of a square wave oscillator pitched one octave below Oscillator 1. Adding a sub octave to sounds such as bass is a great way to increase low-register presence.

Osc Mix: 0…127—Enables the outputs of oscillators 1 and 2 to be mixed in varying amounts. A setting of 0 is equivalent to 100% Oscillator 1 and 0% Oscillator 2. A setting of 127 is the opposite. A setting of 64 is a 50-50 mix of both oscillators.

Noise: 0…127 – Sets the output level of the white noise generator.

Osc Slop: 0…127 – Adds randomized detuning to the oscillators to emulate the tuning instability of vintage analog oscillators. This tuning instability is a big part of what made vintage instruments sound characteristically warm and fat. The oscillators in the Prophet Rev2 are very stable, and will not drift. Use OSC SLOP parameter to dial in as little or as much drift as you like.

Filter

The Filter takes the basic, raw sound of the oscillators and noise generator and subtracts frequencies, changing the harmonic content and character of their sound. This change can be varied over time using the Filter Envelope to produce more dynamic, animated timbres.

The Prophet Rev2's filter is a classic, resonant low-pass Curtis filter that is switchable between 2-pole operation (12 dB per octave) and 4-pole operation (24 dB per octave). The 4-pole filter can self-oscillate when RESONANCE is set to its maximum.
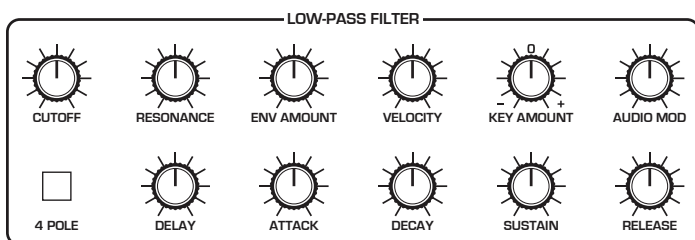
The Prophet Rev2 Filter

Cutoff: 0...164—Sets the filter's cutoff frequency. Frequencies are reduced from the top down, cutting the high frequencies and passing the low frequencies, hence the name "low-pass."

Resonance: 0...127—Emphasizes a narrow band of frequencies around the cutoff frequency. High levels of resonance can cause the filter to self-oscillate in 4-pole mode and generate its own pitch.

High levels of resonance can sometimes cause the Prophet Rev2 outputs to clip. Monitor your outputs carefully to ensure optimal, clean signal levels. If you experience signal clipping, try reducing the levels of the RESONANCE parameter in the filter.

Env Amount: -127...127—Sets the amount of modulation from the filter envelope to the filter's cutoff frequency. Any setting above zero means that each time you strike a key, the filter envelope controls how the filter opens and closes. Higher amounts more dramatically affect the cutoff frequency. This control is bipolar. Positive settings produce standard behavior. Negative settings invert the envelope.

The description of envelope behavior just given is true when the AMOUNT parameter is set to a positive value. But since this control is actually bipolar, it is possible to set a negative amount of modulation. In this case, the envelopes are inverted and their behavior changes. The best way to get a feel for the difference is to experiment with both positive and negative settings of the ENV AMOUNT parameter.

The cutoff frequency setting may limit the effect of the envelope on the filter. For example, in low-pass filter mode , if CUTOFF is at its highest setting, a positive envelope amount will have no effect on the filter since the filter is already completely open.

Velocity: 0...127—Allows key velocity to influence filter frequency. If the AMOUNT is set to a positive value, the harder you play, the more the filter will open and the brighter the sound will be. Conversely, if set to a negative value, the harder you play, the more the filter will close and the less bright the sound will be. This control makes for more touch-sensitive sounds.

Key Amount: 0...127—Sets the amount of modulation from the keyboard to the filter's cutoff frequency. Any setting above zero means that the higher the note played on the keyboard, the more the filter opens. This is useful for adding brightness to a sound as higher notes are played, which is typically how acoustic instruments behave. When set to zero, keyboard filter tracking is off, meaning that filter frequency is unaffected by playing higher or lower notes on the keyboard. When set to 64, the filter will track in half-step increments (which can be useful if you are using the filter to generate a pitch through self-oscillation in 4-pole mode).

Audio Mod: 0...127—Controls the amount of audio from Oscillator 1 used to modulate the filter cutoff frequency. It is useful for adding a bit of harmonic movement and high end sizzle to many sounds, especially in 4-pole filter mode with some filter resonance.

To create bell-like FM sounds with AUDIO MOD, set the filter to 4-pole mode, set AUDIO MOD to 127, set OSC MIX to 127, set OSC 2 SHAPE to off, and set OSC 1 SHAPE to the desired waveshape. Then turn RESONANCE to 127 and experiment different OSC 1 FREQ tunings, filter CUTOFF, and KEY AMOUNT settings. Adjust the filter and amplifier envelopes as necessary.

Filter Envelope

The Prophet Rev2 filter has a dedicated, five-stage envelope generator (DADSR). The Filter Envelope is used to shape the harmonic characteristics of a synthesized sound by giving you filtering control over its attack, decay, sustain, and release stages (plus a delay parameter to delay the onset of the envelope).

This is one of the most important aspects of designing a sound. Without an envelope, the filters would be completely static. They would stay open or closed by a fixed amount that wouldn't change over the duration of a sound. That's not very interesting to listen to and it's not how instruments behave in the real world.

In general, sounds produced by an instrument are brighter at their beginning (the attack stage) and grow mellower as they die out (the decay and release stages). In other words, their harmonic content changes over time. This is exactly what the filter envelope is designed to emulate.
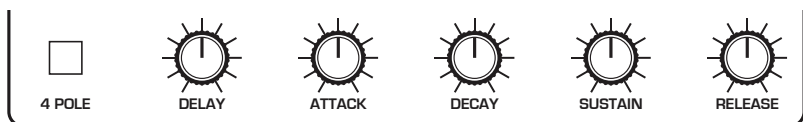
Filter Envelope
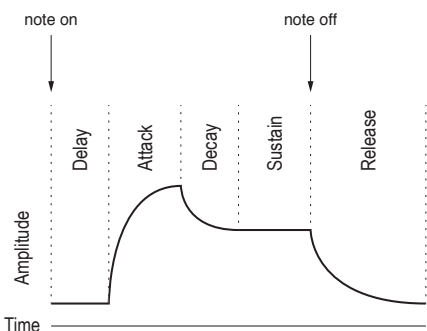
A typical 5-stage DADSR envelope

Delay: 0...127—Sets a delay between the time the envelope is triggered (note on) and when the attack portion actually begins.

Attack: 0...127—Sets the attack time of the envelope. The higher the setting, the slower the attack time and the longer it takes for the filter to open from the level set with the filter CUTOFF knob to the level set by the filter envelope amount. Percussive sounds typically have sharp (short) attacks.

Decay: 0...127—Sets the decay time of the envelope. After a sound reaches the filter frequency set at its attack stage, DECAY controls how quickly the filter then transitions to the cutoff frequency set with the SUSTAIN knob. The higher the setting, the longer the decay. Percussive sounds, such as synth bass, typically have shorter decays (and a generous amount of low-pass filter resonance).

Sustain: 0...127—Sets the filter cutoff frequency for the sustained portion of the sound. The sound will stay at this filter frequency for as long as a note is held on the keyboard.

Release: 0...127—Sets the release time of the envelope. This controls how quickly the filter closes after a note is released.

Amplifier Envelope

After passing through the filters, a synthesized sound goes into an analog voltage controlled amplifier or VCA, which controls its overall volume. The VCA has a dedicated, five-stage envelope generator (DADSR).

The Amplifier Envelope is used to shape the volume characteristics of a sound over time by giving you control over its attack, decay, sustain, and release stages (plus a delay parameter to delay the onset of the envelope). Along with the filter envelope, this is one of the most important factors in designing a sound.

Without a volume envelope, the volume of a sound wouldn't change over the duration of a note. It would begin immediately, remain at its full volume for the duration of the note, then end immediately when the note was released. Again, that's not very interesting sonically and it's not typically how instruments behave in the real world.

To give you a real-world example, the main difference between the sound of the wind and the sound of a snare drum is that they have very different volume envelopes. Otherwise, they are essentially both white noise. Wind has a relatively slow attack, a long sustain, and a long decay and release. A snare drum has a sharp attack, no sustain, and very little decay or release. But again, they are both fundamentally white noise.
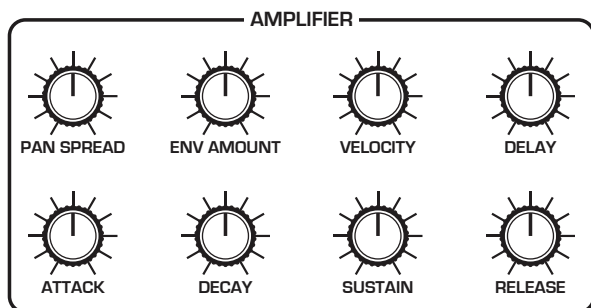
Amplifier Envelope
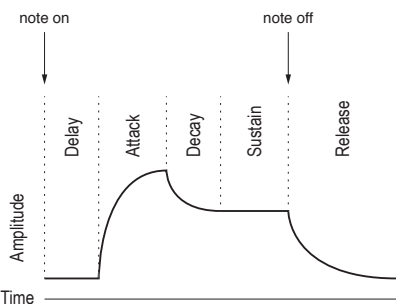
A typical five-stage, DADSR envelope

Delay: 0...127—Sets a delay between the time the envelope is triggered (note on) and when the attack portion actually begins.

Attack: 0...127—Sets the attack time of the envelope. The higher the setting, the slower the attack time and the longer it takes for a sound to reach its full volume. Pads typically have softer (longer) attacks. Percussive sounds have sharper (shorter) attacks.

Decay: 0...127—Sets the decay time of the envelope. After a sound reaches its full volume at its attack stage, DECAY controls how quickly the sound transitions to the level set with the SUSTAIN control. The higher the setting, the longer the decay. Percussive sounds, such as synth bass, typically have shorter decays.

Sustain: 0...127—Sets the sustain level of the envelope. The higher the setting, the louder the sustained portion of the sound will be. The sound will stay at this level for as long as a note is held on the keyboard.

Release: 0...127—Sets the release time of the envelope. This controls how quickly a sound dies out after a note is released.

Pan Spread: 0...127—Pans the audio in the stereo field individually per voice. With a PAN SPREAD setting of zero, all voices are panned in the middle (monophonic). As you turn up PAN SPREAD, the audio in each voice is gradually moved away from the center by different amounts. Every other voice goes in a different direction. This provides a wide stereo field as you play. Any modulation to Pan will individually move each voice from its static position as set by the PAN SPREAD setting.

Env Amount: 0...127—Sets the amount of modulation from the Amplifier Envelope to the VCA. In most cases you will probably want to set this fully clockwise for maximum VCA volume. If you experience signal clipping, try reducing the ENV AMOUNT.

> To recreate the "gated VCA" effect used on certain classic rock anthems, choose an organ sound, then set the ENV AMOUNT of the Amplifier to zero, route the LFO square wave to AMP with an AMOUNT setting of 100% and hold a few chords.

Velocity Amount: 0...127—This enables keyboard velocity to modulate the VCA Envelope Amount. It doesn't enable keyboard velocity to directly control the VCA (loudness). To do this, see the note below.

> To create a program in which velocity controls the VCA, turn VCA ENVELOPE AMOUNT down and turn VELOCITY AMOUNT up. To achieve the best results, it may be necessary to set an initial level using Envelope Amount. Just remember that once Envelope Amount is set to the maximum, no modulation from velocity—or any other source—will cause it to go higher than that.

Auxiliary Envelope

The Prophet Rev2 has an additional five-stage envelope generator. It is useful for creating modulation that varies over time according to the shape of the envelope. Routing an envelope to an oscillator's frequency, for example, causes the oscillator's pitch to rise and fall according to the contour of the envelope.

As with all of the Prophet Rev2's envelopes, there are controls for modulating the envelope amount using keyboard velocity. The Auxiliary Envelope can be routed to any of the modulation destinations in the mod matrix. In addition, the Auxiliary Envelope can repeat (loop) using the ENV 3 REPEAT function in the MISC PARAMS menu. This is useful for cyclical 4-stage modulation.

Actually, any of the Prophet Rev2's envelopes can be routed to any destination (or multiple destinations) using the modulation matrix. See "Modulation" on page 32 for more information.
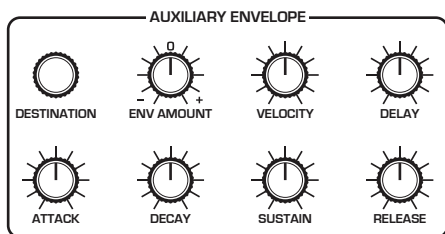
The Auxiliary Envelope

Destination: Various—Selects a modulation destination for the Auxiliary Envelope. See "Modulation Destinations" on page 70 for a list of possible destinations.

Env Amount: -127...127—Sets the amount of modulation from the envelope to the chosen destination. The modulation amount can be positive or negative, allowing for inverted envelope control.

Velocity: 0...127—This enables keyboard velocity to modulate the Envelope Amount. It doesn't enable keyboard velocity to directly control the modulation. To do this, see the user tip that follows

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To create a program in which velocity controls modulation amount, turn AUX ENVELOPE AMOUNT down and turn VELOCITY AMOUNT up.

Delay: 0...127—Sets a delay between the time the envelope is triggered (note on) and when the attack portion actually begins.

Attack: 0...127—Sets the attack time of the envelope. The higher the setting, the slower the attack time and the longer it takes for a sound to reach its full volume. Pads typically have softer (longer) attacks. Percussive sounds have sharper (shorter) attacks.

Decay: 0...127—Sets the decay time of the envelope. After a sound reaches its full volume at its attack stage, DECAY controls how quickly the sound transitions to the level set with the SUSTAIN control. The higher the setting, the longer the decay. Percussive sounds, such as synth bass, typically have shorter decays.

Sustain: 0...127—Sets the sustain level of the envelope. The higher the setting, the louder the sustained portion of the sound will be. The sound will stay at this level for as long as a note is held on the keyboard.

Release: 0...127—Sets the release time of the envelope. This controls how quickly a sound dies out after a note is released.

Low Frequency Oscillators

The four LFOs are special-purpose oscillators that produce a frequency that is typically below the range of human hearing (although these can actually extend into the audio range if set to their maximum frequency). The LFOs are typically used for periodic modulation such as vibrato (periodic pitch modulation) and tremolo (periodic amplitude modulation). They can also be used as modulation sources for any of the many modulatable parameters in the Prophet Rev2.

The LFOs produce a variety of waveshapes, including triangle, sawtooth, reverse sawtooth, square, and random. Though most often used for low-frequency modulation, the Prophet Rev2 LFOs can actually function at speeds that extend into the audible range for extreme effects.
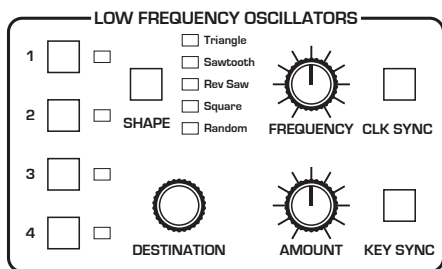
The Low Frequency Oscillators

Triangle and Random waves are bipolar. That is, their waveshape is positive for half of their cycle and negative for the other half. In the case of the triangle wave, this makes it possible to generate a natural-sounding vibrato that goes alternately sharp and flat in equal amounts on either side of a center frequency. Random, also known as "sample and hold," generates a series of random values, each held for the duration of one cycle

The square wave, sawtooth, and reverse sawtooth generate only positive values. In the case of the square wave this makes it possible to generate natural-sounding trills.
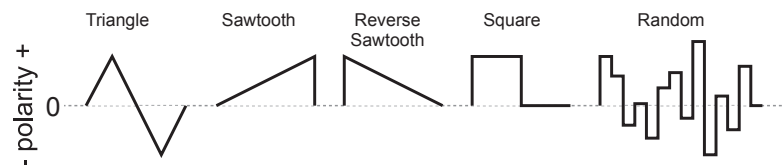
LFO waveshapes

The LFOs can be free-running or synced to the arpeggiator, sequencer, or MIDI clock for tempo-synced effects such as filter sweeps, tremolo, and so on.

Shape: Triangle, Sawtooth, Reverse Sawtooth, Square, Random—This button sets the waveshape of the selected LFO.

Frequency: Sets the frequency of the selected LFO from a slow .022Hz to a fast 500Hz. This is affected by the CLK SYNC (clock sync) parameter as explained below.

Clk Sync: When on, the LFO synchronizes with the master clock, which controls the arpeggiator, sequencer, and certain effects.

Destination: Routes the selected LFO to one of the many modulatable destinations within the synthesizer. You can also use the modulation matrix to route an LFO to additional destinations.

Amount: Sets the amount of LFO modulation routed to the selected destination. Setting an amount here applies the selected modulation continuously. You can also use the modulation matrix to route an LFO to additional destinations and use a different modulation amount if you want.

Key Sync: When enabled, this makes the LFO wave cycle reset when you press a key (but is not reset if you press a key while other notes are held).

There is a shortcut for routing an LFO to a front-panel destination (provided that the destination is a valid destination). Simply hold down the selector button of the desired LFO, then and move the knob or control you want to use as a destination (the filter cutoff, for example). Set the amount using the LFO AMOUNT knobs. Be aware that not all front-panel controls can be used as a modulation destinations.

Modulation

Although the overall sonic character of the Prophet Rev2 is determined by its analog oscillators and filters, much of its power to make truly unique and unusual sounds comes from creative use of modulation. Modulation is the process of routing one parameter (i.e. a control voltage) to another in order to change the way the targeted parameter behaves.

The concept is simple:

1. Choose a source.

2. Choose a destination.

3. Set an amount. The amount can either be positive or negative.

You already understand and apply the concept of modulation whenever you use the filter envelope to control the filter's cutoff frequency. In this case, the modulation *source* is the filter envelope (or more precisely, any of its controls, such as attack, decay, sustain, or release). The modulation *destination*, is the filter's cutoff frequency. The modulation *amount* is set with the ENV AMOUNT knob.

There are twenty-two different modulation sources and fifty-three different destinations to choose from. (See page 70 for a complete list.) There are 8 freely assignable modulation paths (mod slots 1-8) as well as 5 additional dedicated mod sources: Mod Wheel, Pressure (aftertouch), Breath Controller, Velocity, and MIDI Footswitch. This gives you a large number of sound-shaping options.
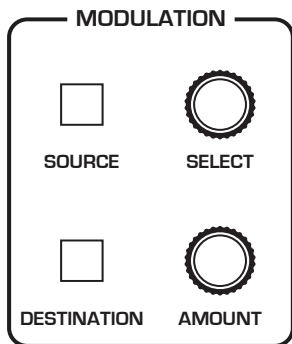
The Modulation section

Modulation Parameters

Source: Selects a modulation source. The are twenty-two different modulation sources. See page 69 for a complete list.

Destination: Selects a modulation destination. The are fifty-three different modulation destinations. See page 70 for a complete list.

Amount Sets the modulation amount. Modulation can be either positive or negative.

Modulation Examples

Below are several modulation scenarios that illustrate how to use the modulation matrix. The examples provide full, step-by-step instructions for clarity.

In actual practice, there are shortcuts for routing modulation to various front panel sources/destinations. Simply hold down the SOURCE button and move the control you want to use as a source (the mod wheel, for example). Then hold down the DESTINATION button and move the control that you want to use as a destination (filter cutoff, for example). Set the amount using the PARAMETER and VALUE knobs next to the display. Be aware that not all front-panel controls can be used as a modulation sources/destinations.

To use the mod wheel to add vibrato:

1. In the LOW FREQUENCY OSCILLATORS section, set LFO 1 to TRIANGLE and set FREQUENCY to 75. Set DESTINATION to OSC ALL FREQ. Set AMOUNT to 0. (You will control the amount with the mod wheel.)

2. In the MODULATION section, press the SOURCE button. Use the PARAMETER knob next to the display to scroll to Mod Slot 1 if it's not already displayed.

3. Use the PARAMETER knob to select the SOURCE field. Use the VALUE knob to scroll through the various mod sources and choose MOD WHEEL

4. Use the PARAMETER knob to select the AMOUNT field. Use the VALUE knob to set the amount to 30.

5. Use the PARAMETER knob to select the DEST field. Use the VALUE knob to scroll through the various mod destinations and choose LFO1 AMT.

6. Hold down a note on the keyboard and turn the mod wheel. You should hear vibrato.

Use PRESSURE as the modulation source instead of the mod wheel in the previous example to add vibrato with key pressure/aftertouch.

To use the mod wheel to control the filter cutoff:

1. In the MODULATION section, press the SOURCE button. Use the PARAMETER knob next to the display to scroll to Mod Slot 1 if it's not already displayed.

2. Use the PARAMETER knob to select the SOURCE field. Use the VALUE knob to scroll through the various mod sources and choose MOD WHEEL.

3. Use the PARAMETER knob to select the DEST field. Use the VALUE knob to scroll through the various mod destinations and choose CUTOFF.

4. Hold down a note on the keyboard (or press the HOLD button and play a note on the keyboard) and turn the mod wheel.

5. Use the PARAMETER knob to select the AMOUNT field. Use the VALUE knob to set the amount to your preference. Higher AMOUNT settings cause the filter to open wider the further you push the mod wheel. A negative amount setting will close the filter the further you push the mod wheel.

Use PRESSURE as the modulation source instead of the mod wheel in the previous example to open the filter (positive AMOUNT) or close the filter (negative AMOUNT) with key pressure/aftertouch.

Other modulation ideas:

- Route ENV 3 to OSC ALL FREQ to create a rising or falling pitch effect each time your press a key. This technique is often used to create the "attack pitch blip" effect in classic synth brass sounds.

- Route an LFO to PAN to create an auto-panning effect. Panning width is controlled by the modulation amount. Panning speed is controlled by the LFO frequency. Add a second mod path to control the LFO speed with the Mod Wheel for a faux rotating speaker spin-up/spin-down effect. Enable the chorus effect and set up a third mod path to control FX MIX with the mod wheel for even better results.

- Route the mod wheel to OSC MIX and set Oscillator 1 and 2 to different frequencies and/or waveshapes. Then transition between them with the mod wheel. Set OSC 1/2 mix to 0 and MOD AMOUNT to 127. This is one way to simulate a guitar feedback effect, especially on sounds that use the distortion effect. Oscillator 1 could be the main tone and Oscillator 2 could be the "feedback harmonic." Set up a second mod path to also add vibrato with the mod wheel.

Effects

The Prophet Rev2 allows you to add an effect to any sound. In stacked or split sounds, each layer can have its own effect.

Adding a touch of reverb or delay can add a subtle (or not so subtle) sense of ambience and depth. Other effects such as the chorus and phaser are useful for adding more obvious tonal enhancement and are also useful for emulating classic instruments such as string synthesizers.

While the effects themselves are digital, the main signal path of the Prophet Rev2 is analog. The ON/ OFF switch enables and disables an effect, ensuring an analog signal path when off.

Effects settings are saved individually with each program. Time-based effects such as the delays can be synchronized to the arpeggiator, sequencer, or MIDI clock to produce repeats that occur on the beat.
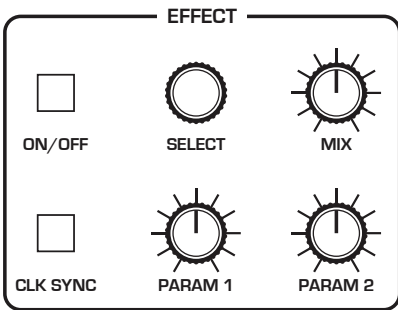
The Effect section

Effects:

- Delay Mono - classic mono delay
- DDL Stereo - classic digital delay
- BBD Delay - vintage bucket-brigade emulation
- Chorus - vintage chorus
- Phaser High - vintage 6-stage phaser, high feedback
- Phase Low - vintage 6-stage phaser, lower feedback
- Phaser Mst - emulation of Tom Oberheim's original 6-stage phaser

- Flanger 1 - vintage through-zero flanger, high feedback

- Flanger 2 - vintage through-zero flanger, no feedback

- Reverb - classic digital reverb with adjustable size and color

- Ring Mod - emulation of Tom Oberheim's classic ring modulator

- Distortion - digital distortion (analog emulation)

- HP Filter - high-pass filter.

For best performance, run the flangers and high-pass filter 100% wet. (i.e. set the MIX parameter to 127).

To use Effects:

1. Press the ON/OFF switch to turn on effects.

2. Turn the SELECT knob to choose an effect, depending on which you want to apply and configure.

3. Turn the MIX knob to blend in a good amount of the processed signal. You'll want to be able to clearly hear the effect when you tweak its settings. You can dial it down afterward.

4. Use the PARAM 1 and PARAM 2 knobs to adjust the effect's parameters to your taste. See "Effects Parameters" on page 36 for details on the adjustable parameters on each effect type.

5. Finally, adjust the MIX knob again to optimize the amount of the effect. Full left is completely dry. Full right is completely wet (a 100% processed signal).

Effects Parameters

On/Off: Turns the effect on or off. On stacked or split sounds, enable the EDIT LAYER B button to affect Layer B.

Select: Selects the effect type.

Mix: 0...127—Sets the balance between the processed (wet) signal and unprocessed (dry) signal. Full left is completely dry. Full right is completely wet.

Clk Sync: On, Off—When a delay effect is chosen, this enables syncing of the timed delay repeats (feedback) to the arpeggiator, sequencer, or MIDI clock. When CLK SYNC is on, delay time (parameter 1) provides the following values:

Value	Delay Time
Whole	4 beats
Half dot	3 beats
Half	2 beats
Quarter dot	1 1/2 beats
Quarter	1 beat
Quarter triplet	1 1/3 beats
8th dot	3/4 of 1 beat
8th	1/2 of 1 beat
8th triplet	1/3 of 1 beat
16th dot	3/8 of 1 beat
16th	1/4 of 1 beat

Maximum delay time is 1 second. The combination of longer synced delay times with slower tempos can result in delay times that would be greater than 1 second. When that happens, the delay time is divided by 2 until it no longer exceeds the 1 second limit. For example, if the BPM is set to 60 and Delay Time (Parameter 1) is set to Half, the expected delay time would be 2 seconds. The actual delay time will be 1 second (i.e. 2 seconds divided by 2).

Parameter 1: Variable, depending on the effect—This knob adjusts parameter 1 for the chosen effect. Each effect has two adjustable parameters, which differ depending on the effect.

Parameter 2: Variable, depending on the effect—This knob adjusts parameter 2 for the chosen effect. Each effect has two adjustable parameters, which differ depending on the effect.

Effect Type	Parameter 1	Parameter 2
mono delay	delay time	feedback amount
DDL stereo	delay time	feedback amount
BBD delay	delay time	feedback amount
chorus	rate	depth
phaser high	rate	depth
phaser low	rate	depth
phaser mst	rate	depth
flanger 1	rate	depth
flanger 2	rate	depth
reverb	time	color
ring mod	ring mod tuning	low-note pitch tracking on/off
distortion	gain	tone
HP filter	cutoff	resonance

To recreate a classic bucket-brigade time-shifting effect, try adjusting the delay time parameter in real time.

The ring modulator's mode of operation is determined by Parameter 2, (pitch tracking) which can be set to either ON or OFF. With this parameter off, the ring modulator functions like the original Oberheim unit. In this mode, pitch tracking is off, and Parameter 1 sets the modulation frequency, which remains the same regardless of what note you play on the keyboard. With parameter 2 on, the ring modulator tracks the pitch of the lowest note that you play on the keyboard. In this case the Parameter 1 sets a ratio between the lowest note that you play and the modulator note (instead of setting a fixed frequency). The modulation frequency will then change as you change the lowest note that you're playing, so that the ratio will remain constant between the note that you play and note of the modulator. If you are only playing one note at a time, then the ring modulator will modulate with the same ratio as you play up and down the keyboard. Set Parameter 2 to the "on" position to get more musical results.

Arpeggiator

The Prophet Rev2 has a full-featured arpeggiator. Turn it on, hold a chord and the synthesizer will play a pattern based on the individual notes held. Choose a mode (up, down, random, etc.), an octave range (1, 2, or 3), and a tempo, then pair it with an appropriate sound and explore.

While you hold down a chord, pressing any additional notes will add those notes to the arpeggio. You can change chords and notes and the arpeggio will continue to play as long as at least one note is always held.

You can also use the HOLD feature with the arpeggiator. When you enable HOLD, you can release the notes on the keyboard and the arpeggio will continue to play — with any additional notes that you play added to the arpeggio.

> To prevent the arpeggiator from adding new notes to an arpeggio when keys are continuously held (and instead start a new arpeggio each time you change notes), turn arp relatch ON in the arpeggiator. To do this, press the arpeggiator's MODE button and scroll to the arp relatch menu item in the display.

Set the tempo of the arpeggiator with the TAP TEMPO or BPM and DIVIDE controls in the CLOCK section. To use TAP TEMPO, tap this button at least 4 times to set the tempo. You can also sync the arpeggiator to external MIDI clock, or even an external audio signal. When the arpeggiator is playing, the sequencer is disabled.
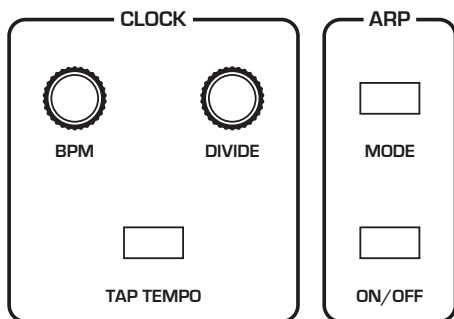
The Clock and Arpeggiator controls

To use the arpeggiator:

1. Press the arpeggiator ON/OFF switch to turn it on.

2. Hold down one or more notes on the keyboard. The arpeggiator plays them according to the settings you've chosen.

3. To latch arpeggiation on (so that you don't have to continuously hold down notes) press the HOLD button.

4. Adjust settings such as MODE, OCTAVE, REPEATS, and BPM.

5. To synchronize a delay effect to the arpeggiator, turn on CLK SYNC in the EFFECTS section, choose a delay, and adjust its delay time setting as desired.

An audio signal connected to the rear-panel SEQUENCE jack can be used to control arpeggiator (and sequencer) playback. This makes it possible to tempo sync the arpeggiator to a recorded drum track or other audio source. Audio signals used to drive the arpeggiator/sequencer should not exceed 5 volts peak-to-peak. See "Seq Pedal Mode" on page 17 for more information about choosing the appropriate mode for these behaviors.

Arpeggiator Parameters

On/Off—This button turns the arpeggiator on and off.

Mode: Pressing this button shows various arpeggiator options in the OLED display. You can scroll through these and choose their settings with the PARAMETER and VALUE knobs.

Arp Mode: Sets the order in which notes play when the arpeggiator is on. See the table.

Arp Mode	Behavior
Up	Plays from lowest to highest note
Down	Plays from highest to lowest note
Up + Down	Plays from lowest to highest and back to lowest
Random	Plays notes in random order
Assign	Plays notes in the order the keys were pressed

Arp Range: 1, 2, 3 —Set to 1, only the held notes are arpeggiated. Set to 2, the held notes and the notes one octave above them arpeggiate. Set to 3, the held notes and the notes one and two octaves above them arpeggiate.

Arp Repeats: 1, 2, 3 —Set to 1, each note in the arpeggio plays once. Set to 2, each note in the arpeggio plays twice. Set to 3, each note in the arpeggio plays three times.

Arp Relatch: Off, On—Works in conjunction with HOLD. When HOLD and the arpeggiator are on, and ARP RELATCH is off, played notes are held on and arpeggiated, with additional played notes added to the held notes and the arpeggio. When ARP RELATCH is on, played notes are held on and arpeggiated, but additional played notes will restart the arpeggio with the new notes.

Clock Parameters

BPM: 30…250—Sets the tempo for the arpeggiator in BPM (beats per minute). The TAP TEMPO LED flashes at the BPM rate. When LFO SYNC is enabled on the low-frequency oscillator, or CLK SYNC is enabled in the Effects section, the BPM rate affects the LFO frequency and/or delay effect. When syncing to an external MIDI clock source, the BPM setting has no effect.

Divide—Selects a basic note value relative to the BPM. See the table below:

Name	Tempo	Timing Division
Half	BPM/2	Half note
Quarter	BPM	Quarter note
8th	BPM x 2	Eighth note
8 Half	BPM x 2	Eighth note, half swing timing
8 Swing	BPM x 2	Eighth note, full swing timing
8 Trip	BPM x 3	Eighth note triplets
16th	BPM x 4	Sixteenth note
16 half	BPM x 4	Sixteenth note, half swing timing
16 Swing	BPM x 4	Sixteenth note, full swing timing
16 Trip	BPM x 6	Sixteenth note triplets
32nd	BPM x 8	Thirty-second note
32 Trip	BPM x 12	Thirty-second note triplets
64 Trip	BPM x 16	Sixty-fourth note triplets

Tap Tempo—Tapping the TAP TEMPO button sets the tempo. The LED flashes at the BPM rate you set. For best results, tap the button 4 times.

Sequencer

There are 2 types of sequencers in the Prophet Rev2:

- 1-track, 64-step polyphonic sequencer for creating a repeating pattern of chords and melodies

- 4-track, 16-step, non-polyphonic gated sequencer for creating a repeating pattern for modulation (and can also be used for notes)
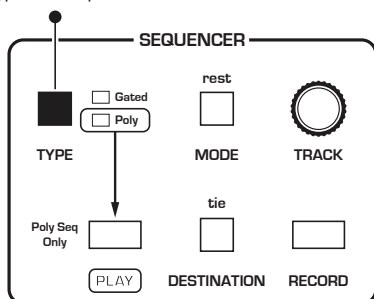
The Sequencer

Polyphonic Sequencer

With the polyphonic sequencer you can create sequences that are rhythmically and melodically complex by constructing a repeating musical phrase with notes, ties, and rests. You can play up to 64 steps with up to 6 notes held simultaneously per step. Use the BPM, DIVIDE, or TAP TEMPO controls to adjust sequencer playback speed.

In addition, you can play along with a sequence (provided there is available polyphony), making it a powerful live performance tool. When the sequencer is playing, the arpeggiator is disabled.

All factory programs have a sequence associated with them. Recall a program and press the sequencer's PLAY button to hear its associated sequence.

An audio signal connected to the rear-panel SEQUENCE jack can be used to control sequencer playback. This makes it possible to tempo sync the sequencer (or arpeggiator) to a recorded drum track or other audio source. Audio signals used to drive the arpeggiator/sequencer should not exceed 5 volts peak-to-peak. See "Seq Pedal Mode" on page 17 for more information about choosing the appropriate mode for these behaviors.

Programming the Polyphonic Sequencer

For most sequences you'll probably want to use sounds with a relatively sharp attack and short release.

To program a note sequence:

1. Press the RECORD button.

2. Perform the sequence on the keyboard. The display indicates the current step, note, and velocity as you play.

When recording a chord as a step, as long as you continue to hold at least one note down, you can keep adding notes to the chord/step, and even use the TRANSPOSE buttons to extend the keyboard range while doing it.

3. To add a rest as you play, press the sequencer's MODE button for that step, then continue playing. To add multiple rests, press the MODE button once for each rest that you want to add.

4. To add a tie that extends the length of a note, play the note or chords, then press the sequencer's DESTINATION button repeatedly to extend the note the number of steps you want.

5. To step back in the sequence, turn the sequencer's PARAMETER knob counterclockwise. This will allow you to step backward to the desired step so that you can rerecord it.

6. When you're done, press PLAY to listen to your sequence.

7. To save the sequence, save the program and they are saved together. (See "Saving a Program" on page 5.)

To play a polyphonic sequence:

1. Press PLAY. The sequence plays back at the current BPM setting.

2. To stop playback, press PLAY again.

📝 Alternatively, you can start and stop sequencer playback using a footswitch connected to the rear-panel SEQUENCER jack or using MIDI start/stop messages sent from a DAW or other MIDI device. See "Seq Pedal Mode" on page 17 for more information.

💡 Use the BPM, DIVIDE, or TAP TEMPO controls to adjust sequencer playback speed.

To transpose a polyphonic sequence:

1. Press PLAY. The sequence begins playback.

2. Press and hold RECORD and press a key on the keyboard. "Middle C" is the reference point. Playing a note above middle C transposes the sequence higher by that interval. Playing a note below middle C transposes the sequence lower by that interval.

Editing a Polyphonic Sequence

You can edit a sequence after you've recorded it. This is convenient for fixing mistakes or modifying it without having to completely re-perform it.

To edit a polyphonic sequence:

1. Press the sequencer's RECORD button.

2. Use the sequencer's TRACK knob to select the track (1-6). Because you can record up to 6 notes per step, tracks 1-6 each represent a note. If a track/step has no note recorded on it, the Velocity parameter will say "Rest."

3. Use the sequencer's PARAMETER knob to select the step you want to edit. If a track/step has no note recorded on it, the Velocity parameter will say "Rest."

4. Use the sequencer's VALUE knob to change the note (C0 - G10). Turn the knob fully clockwise to add a tie. Alternatively, press a key on the keyboard to enter the note quickly (along with the velocity at which you play it).

5. If you make a mistake, or simply want to re-enter a note or change its velocity use the sequencer's PARAMETER knob to step backward or forward to the step you want to edit.

6. To edit a note's velocity numerically, hold down the RECORD button and turn the VALUE knob.

7. To save the sequence, save the program by pressing the WRITE button twice.

Copying a Polyphonic Sequence Between Layers

You can copy a sequence from Layer A to Layer B and vice-versa. You can also swap sequences between layers.

To copy a sequence on Layer A to Layer B:

1. Press both the SPLIT A|B button and the STACK A+B button simultaneously.

2. Turn the PARAMETER knob and select COPY SEQ A TO B.

3. Press the WRITE button.

To copy a sequence on Layer B to Layer A:

1. Press both the SPLIT A|B button and the STACK A+B button simultaneously.

2. Turn the PARAMETER knob and select COPY SEQ B TO A.

3. Press the WRITE button.

To swap the sequences on Layer A and Layer B:

1. Press both the SPLIT A|B button and the STACK A+B button simultaneously.

2. Turn the PARAMETER knob and select SWAP SEQ A AND B.

3. Press the WRITE button.

Gated Sequencer

The gated sequencer provides four 16-step sequences that play in parallel. Each sequence can be routed to a chosen modulation destination. Each step in a sequence can be set to a different value used to modulate that destination.

Unlike the polyphonic sequencer, the gated sequencer doesn't play notes unless one or more of the sequences are routed to oscillator frequency. A gated sequence is really just a series of events at timed intervals that changes the value of one of the synth's parameters in discrete steps.

Because the four sequences play in parallel, up to four parameters can be affected by each step, one per sequence. For the most part, the sequence destinations are the same as the modulation destinations, since a gated sequence is really just another modulation source.

For each sequence step, the envelopes are gated on for half the step's duration. The duration varies according to the BPM and Divide settings (or the MIDI clock, if synced to an external source). The envelope settings of the current program ultimately determine how long each step plays, however, and longer (more legato) or shorter (more staccato) effects can be achieved by editing the filter and or amplifier envelopes.

The sequencer requires a note to be gated on — that is, played from the keyboard or via MIDI — in order for the sequencer to run. There is no dedicated start or play button and it doesn't respond to MIDI start/stop/continue messages. But it can still sync to an external clock.

To start the gated sequencer running, simply press the TYPE button to select the gated sequencer, then hold down a note. Sequencer playback then begins.

An audio signal connected to the rear-panel SEQUENCE jack can be used to control sequencer playback. This makes it possible to tempo sync the sequencer (or arpeggiator) to a recorded drum track or other audio source. Audio signals used to drive the arpeggiator/sequencer should not exceed 5 volts peak-to-peak. See "Seq Pedal Mode" on page 17 for more information.

Programming the Gated Sequencer.

To program a gated sequence:

1. Press the TYPE button and toggle to the gated sequencer.

2. Press the MODE button and use the VALUE knob to select the desired mode. See "Sequencer Parameters" on page 48.

3. Use the TRACK knob to select desired track.

4. Press the DESTINATION button and use the VALUE knob to select the desired destination.

5. Use the PARAMETER knob to navigate to step 1 (or any desired step, 1-16).

6. Use the VALUE knob to enter a value from 0-125. Choosing RESET marks the end of the sequence if you want to use fewer than 16 steps. The sequence will loop when it reaches that step.

7. Repeat steps 5-6 as necessary to create the rest of the gated sequence.

8. When you're done, hold down a key to listen to your sequence.

9. To save the sequence, save the program and they are saved together. (See "Saving a Program" on "Saving a Program" on page 4.)

Try using different sequence lengths on different gated sequencer tracks to create non-repetitive modulations. For example, if track 1 utilizes the full 16 steps, set track 2 to repeat after 12 steps (by setting step 13 to RESET).

Gated sequencer tracks are also modulation sources and appear as such in the modulation matrix. This means that you can route a gated sequencer track to multiple destinations.

Using Slew

In modular analog synthesizers, a lag processor or slew limiter is used to create a smooth transition between successive, discrete control voltage levels. The rate of change is called the slew rate and one common application is to create a glide (aka portamento) effect between notes.

Among the possible destinations for gated sequences, tracks 2 and 4 offer a sequencer-only parameter called Slew. Slew behaves a little differently from the other modulation destinations, in that it is not really a destination at all. Instead, it affects the sequence in front of it. That is, if Slew is the chosen destination for sequence 2, it controls sequence 1, and Slew in sequence 4 controls sequence 3.

In the gated sequencer, Slew sets the slew rate between the previous step's value and the current step's value when the step is gated on. For example, let's say sequence 1 is routed to oscillator frequency and sequence 2 to Slew. Increasing the Slew value for step 4 will cause the oscillator frequency to glide from the step 3 value when step 4 is gated on. The higher the Slew value, the slower the slew rate. And the slew rate can be different for each step. But its not just for oscillator glide. Slew can be applied to any of the destinations. For example, sequence 3 could be routed to filter cutoff with Slew in sequence 4 used to create a less abrupt transition from one step to the next.

Depending upon the BPM and Clock Divide settings, the slew rate can actually exceed the time the envelopes are gated on, causing a step in the affected sequence to not reach its set value. For example, if Slew is applied to oscillator frequency, high Slew values may cause a step to sound flat or sharp. If that's not what you want, simply reduce the Slew value.

Sequencer Parameters

Type: Gated, Poly—This switch toggles between the polyphonic sequencer and the gated sequencer.

Play: On, Off—This switch starts and stops polyphonic sequencer playback.

Record: On, Off—This switch turns sequencer recording/editing on and off on the polyphonic sequencer.

Destination: Various—In the gated sequencer, this button allows you to select a modulation destination for the currently selected track. Destinations appear in the display. Use the VALUE knob to choose the destination.

Track: 1, 2, 3, 4—This knob allows you to select a track for recording or editing.

Mode: Normal, No Reset, No Gate, No G/R,Key Step—Selects one of the following operation modes for the gated sequencer:

> **Normal:** Good for melodic and rhythmic sequences. With each step, the envelopes are retriggered, so works best with shorter envelop contours. Each new key press/received MIDI note starts the sequence for that key/note at step one. When programming melodies, the note value you select is relative to the note/key played, and not the actual note played back for that step. For example, if you set track one to OSC ALL FREQ., and set step one to C2, playing Middle C on the keyboard will produce C two octaves above middle C on step one. A value of C0 will produce the exact note that you play on the keyboard. A value of G0 will produce the note a 5th above what you play on the keyboard.

> **No Reset:** Same as Normal, except that new key presses/received MIDI notes do not begin the sequence for that note at step one. In this sense, the gated sequencer is free-running in No Reset mode. This makes is less useful for melodies, but still great for rhythmic parameter changes.

> **No Gate:** In this mode, the envelopes respond to the keyboard/received MIDI notes, and not by each advancing sequencer step. This mode is great for complex parameter modulation of sounds with long envelope contours, such as pad sounds. Each new key press/received MIDI note starts the sequence for that key/note at step one.

> **No Gate No Reset:** Same as No Gate, except that new key presses/received MIDI notes do not begin the sequence for that note at step one.

> **Key Step:** Striking any key or playing a note via MIDI advances the sequencer one step.

Clock Parameters

BPM: 30…250—Sets the tempo for the sequencer and arpeggiator in BPM (beats per minute). The TAP TEMPO LED flashes at the BPM rate. When LFO SYNC is turned on, the BPM rate affects the LFO frequency. When syncing to an external MIDI clock source, the BPM setting has no effect.

Tap Tempo: 30…250—Tap this button at least 4 times to quickly set the tempo for the sequencer and arpeggiator. The LED flashes at the BPM rate you set.

Divide: Sets the note value for each sequencer/arpeggiator step relative to the BPM. DIVIDE works with both internal and external clock sources. The following table lists the values:

Name	Tempo	Timing Division
Half	BPM/2	Half note
Qtr	BPM	Quarter note
8th	BPM x 2	Eighth note
8th Half	BPM x 2	Eighth note, half swing timing
8th Swing	BPM x 2	Eighth note, full swing timing
8th Trip	BPM x 3	Eighth note triplets
16th	BPM x 4	Sixteenth note
16th Half	BPM x 4	Sixteenth note, half swing timing
16th Swing	BPM x 4	Sixteenth note, full swing timing
16th Trip	BPM x 6	Sixteenth note triplets
32nd	BPM x 8	Thirty-second note
32nd Trip	BPM x 12	Thirty-second triplets
64th	BPM x 16	Sixty-fourth note

Unison

When UNISON is on, the Prophet Rev2 functions like a monophonic synthesizer in that only one note can be played at a time. However, that one note can be powered by as many as 8 or 16 voices, depending on how many you choose to use (and whether you have an 8 or 16-voice Prophet Rev2). With many oscillators powering a single note, you can create some very dense, speaker-rattling sounds.

If you want to create an ultra-heavy synth bass, try using Unison!

Unison gives you control over not only how many voices to stack, but also the amount of detuning between the oscillators (with the UNISON DETUNE parameter in the MISC PARAMS menu), and what note gets priority if you happen to play more than one note on the keyboard. (This is called the key assign mode or *note priority*. See "Key Modes" on page 53 for details.)

UNISON

The Unison button

Use this knob to scroll to the "Unison Mode" Parameter

PARAMETER

U1 P1 120
Filter Sweep

Unison Mode

4 Voices

Use this knob to select the number of unison voices (or chord memory)

VALUE

show

MISC PARAMS

Press to toggle on Misc Parameters
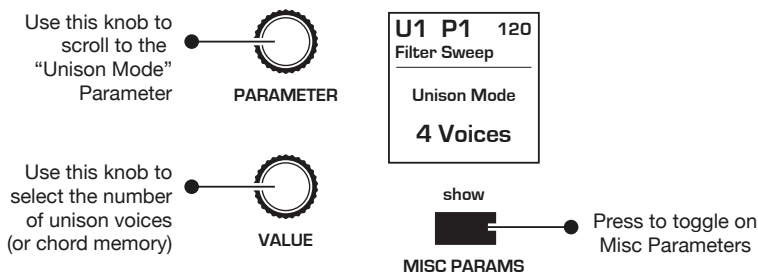
Unison Mode parameter

To use Unison:

1. Press the UNISON button.

2. Press the MISC PARAMS button and use the PARAMETER knob to scroll to UNISON MODE.

3. Use the VALUE knob to choose the number of voices to stack.

4. To detune the oscillators while in unison, use the PARAMETER knob to scroll to UNISON DETUNE in the MISC PARAMS menu.

5. Use the VALUE knob to choose the amount of detuning.

Using Chord Memory

Unison has another useful feature: chord memory. Instead of assigning voices to a single note, hold down a chord on the keyboard and press the UNISON button. The Prophet Rev2 memorizes the notes of the chord. Single notes played on the keyboard will then trigger all notes of the stored chord, transposing them as you play up or down the keyboard. Try using this feature to create powerful chord stabs.

If you save a program that uses chord memory, the chord is saved with the program.

To use chord memory:

1. Press the MISC PARAMS button and use the PARAMETER knob to scroll to UNISON MODE.

2. Turn the VALUE knob fully clockwise to choose CHORD.

3. Hold down a chord on the keyboard.

4. Press the UNISON button. The chord voicing is memorized. Play a few notes to listen to the result.

5. If you save the program, the unison chord memory is saved with it.

To store a different chord in chord memory:

1. With chord selected as the unison mode in the MISC PARAMS menu, hold down a different chord on the keyboard.

2. Press the UNISON button. The chord voicing is memorized. Play a few notes to listen to the result.

To switch back to single-note unison mode:

1. Press the MISC PARAMS button and use the PARAMETER knob to scroll to UNISON MODE.

2. Turn the VALUE knob to choose the number of voices to stack.

Key Modes and Unison Mode

Key Mode (sometimes called note priority) determines what note has priority when more than one note is played on the keyboard or via MIDI. This is particularly important when using Unison Mode:

- Low-Note Priority is most common in vintage synths and is often used for playing trills by holding a note and repeatedly tapping a lower note.

- Low Retrigger causes the envelopes to be retriggered with each keystroke.

- High Note and High Retrigger are similar to the low note settings, except that the highest note is given priority.

- Last Note and Last Retrigger give priority to the last note played.

To choose the Key Mode:

1. Press the MISC PARAMS button and use the PARAMETER knob to scroll to the desired mode.

2. Play a few notes to listen to the result.

Key Assign settings are only relevant to Unison mode. They do not affect polyphonic playback.

Master Volume/Program Volume

The master output level of the Prophet Rev2 is controlled by the front-panel MASTER VOLUME knob. In addition, the volume of an individual program can be set with the MISC PARAMS controls. This is useful for ensuring that your sounds have roughly the same volume from program to program. Unison sounds in particular can be very loud compared to other programs.

```
┌─────────────────────┐
│ U1  P1     120      │
│ Filter Sweep        │
│ ─────────────────   │
│ Program Volume      │
│       127           │
└─────────────────────┘

         show
      ┌──────┐
      │      │────●  Press to toggle on
      └──────┘       Misc Parameters
    MISC PARAMS
```
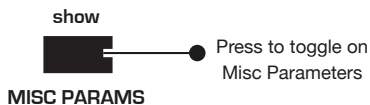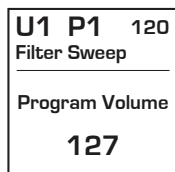
Program Volume

To set the volume of an individual program:

1. Choose a program.

1. Press the MISC PARAMS button and use the PARAMETER knob to scroll to PROGRAM VOLUME.

2. Hold down a chord on the keyboard.

3. Turn the VALUE knob to set the volume level from 1 to 127.

4. Save the program. (See "Saving a Program" on page 4.)

📝 MIDI volume can also influence the overall volume of the Prophet Rev2 if you are controlling it from an external MIDI source.

Pan Spread

Pan Spread, in the Amplifier section, pans audio in the stereo field individually per voice. Set to 0, all voices are panned to the center. As you turn the PAN SPREAD knob clockwise, each voice is gradually moved away from the center by greater amounts. Every other voice goes in a different direction, left or right. This creates a broader stereo field while playing.
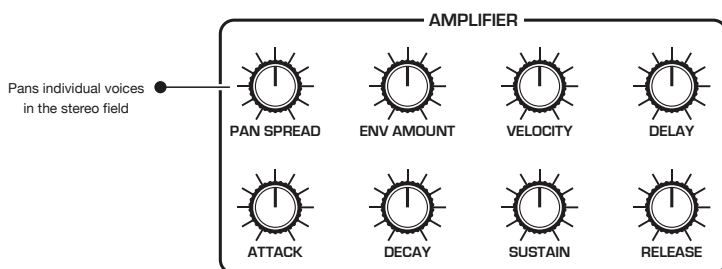
Pan Spread

Transpose

The UP and DOWN buttons in the TRANSPOSE section transpose the keyboard up or down in octaves. The LED indicates the current keyboard transposition state. Transposing the keyboard also changes the MIDI note numbers of the keys so that MIDI notes sent are also transposed. Transpose settings are global and are not saved with individual programs.
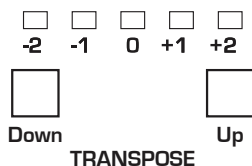
The Transpose controls

Hold

When HOLD is on, any notes played will continue to play until HOLD is turned off. When used in conjunction with the arpeggiator, notes are latched on. If HOLD is on and at least one key continuously held down, any new notes played are added to the arpeggio.

HOLD

The Hold button

Glide

Glide causes the pitch of a note to glide up or down from the pitch of the previously played note. Glide is turned on and off using the GLIDE switch, but the RATE must also be set. If the GLIDE button is on, but RATE is set to 0, glide has no effect.

RATE

GLIDE

The Glide controls

To use glide:

1. Press the GLIDE button.

2. Play a series of notes up and down the keyboard while you turn the RATE knob to adjust the amount of glide.

To set the glide amount separately for each oscillator:

1. Press the GLIDE button.

2. Press the MISC PARAMS button and use the PARAMETER knob to scroll to OSC 1 GLIDE.

3. Turn the VALUE knob to set the mode and play a series of notes up and down the keyboard to hear the effect.

4. Next, use the PARAMETER knob to scroll to OSC 2 GLIDE.

5. Turn the VALUE knob to set the mode and play a series of notes up and down the keyboard to hear the effect.

There are four modes that determine how glide behaves.

Fixed Rate: The time to transition between notes varies with the interval between the notes; the greater the interval, the longer the transition time. The glide rate is fixed. This is the default glide mode.

Fixed Rate A: The same as Fixed Rate, but glide is only applied when playing legato. That is, glide only occurs when a note is held until the next note is played. This effectively allows glide to be turned on and off from the keyboard.

Fixed Time: Glide is set to a fixed time, regardless of the interval between notes.

Fixed Time A: The same as Fixed Time, but glide only occurs when playing legato.

To select a glide mode:

1. Press the GLIDE button.

2. Press the MISC PARAMS button and use the PARAMETER knob to scroll to GLIDE MODE.

3. Turn the VALUE knob to set the mode.

4. Play a series of notes up and down the keyboard to hear the effect.

Pitch and Mod Wheels

The Prophet Rev2 has a spring-loaded Pitch wheel and a Mod wheel. You can use these controls to enhance live performance by bending notes and adding modulation in real time as you play.

In the same way that guitar players use note bends and vibrato to give their playing expressiveness and character, these two controls can help you define your sound as a performer and take you beyond just playing notes on the keyboard.

Pitch   **Mod**
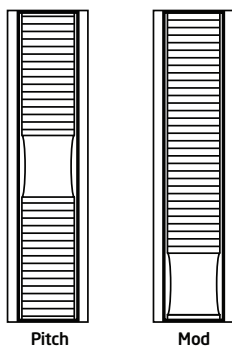
The Pitch and Modulation wheels

Pitch Wheel

You can set a range in semitones for the pitch wheel, depending on your playing preference. The range is up to 12 semitones (1 octave). Many musicians use a range of 2 semitones (a whole step) since this is the bend range of many acoustic instruments. For guitar whammy bar effects, you many wish to set a wider range.

> *To set the pitch bend range:*

> 1. Press the MISC PARAMS button and use the PARAMETER knob to scroll to PITCHBEND RANGE.

> 2. Turn the VALUE knob to set the range in semitones.

> 3. Hold a note and move the pitch wheel wheel to hear the effect.

Modulation Wheel

The mod wheel controls the amount of modulation for any program that uses it as a modulation source. This allows you to "perform" modulation in real time by moving the wheel. This is a great way to add expressiveness to a sound or performance by using it to control vibrato, filter effects, and potentially a lot more.

To choose a modulation destination for the Mod wheel:

1. In the MODULATION section, press the SOURCE button. Use the PARAM- ETER knob next to the display to scroll to Mod Slot 1 if it's not already displayed.

2. Use the PARAMETER knob to select the SOURCE field. Use the VALUE knob to scroll through the various mod sources and choose MOD WHEEL.

3. Use the PARAMETER knob to select the DEST field. Use the VALUE knob to scroll through the various mod destinations and choose a parameter (such as CUTOFF).

4. Hold down a note on the keyboard (or press the HOLD button and play a note on the keyboard) and turn the mod wheel.

5. Use the PARAMETER knob to select the AMOUNT field. Use the VALUE knob to set the amount to your preference. Higher AMOUNT settings add greater modulation the further you push the mod wheel. A negative amount setting will apply modulation in the negative direction.

Adding Aftertouch

Aftertouch is a performance feature that allows you to add modulation to a sound by applying additional pressure to a key after the key is already down. The greater the pressure applied, the more modulation is applied. The Prophet Rev2 provides *monophonic* (or "channel") aftertouch, which means that applying pressure to any key within a chord will apply modulation to *all* notes currently held.

The MODULATION section lets you choose the amount of modulation applied using aftertouch and also which parameters are modulated (oscillator frequency, filter frequency, etc.). You can set either a positive or negative amount.

For example, if you select the filter cutoff as modulation destination (CUTOFF), set a *positive* amount of pressure, then press the keys harder, the filter cutoff frequency will increase, making the filter open wider and the sound become brighter.

Conversely, if you select the filter frequency as destination, set a *negative* amount of pressure, then press the keys harder, the filter cutoff frequency will be lowered, making the filter close more and the sound become more muted.

To choose aftertouch (pressure) as a source for modulation:

1. In the MODULATION section, press the SOURCE button. Use the PARAMETER knob next to the display to scroll to Mod Slot 1 if it's not already displayed.

2. Use the PARAMETER knob to select the SOURCE field. Use the VALUE knob to scroll through the various mod sources and choose PRESSURE.

3. Use the PARAMETER knob to select the DEST field. Use the VALUE knob to scroll through the various mod destinations and choose a parameter (such as CUTOFF).

4. Hold down a note on the keyboard. Then, press harder.

5. Use the PARAMETER knob to select the AMOUNT field. Use the VALUE knob to set the amount to your preference. Higher AMOUNT settings add greater modulation the harder you press a key. A negative amount setting will apply modulation in the negative direction.

The Prophet Rev2 provides four different pressure response settings for your convenience. The default setting provides a linear response. To choose a different response curve, use the PRESSURE CURVE parameter in the GLOBAL menu.

Misc Parameters

The MISC PARAMETERS button allows you to access controls for a number of essential functions, described below.

Program Volume: 0…127—The master output level of the Prophet Rev2 is controlled by the front-panel MASTER VOLUME knob. In addition, the volume of an individual program can be set with the PROGRAM VOLUME parameter. This is useful for ensuring that sounds have roughly the same volume from program to program. Unison sounds in particular can be very loud compared to other programs.

Osc 1 Note Reset: Off, On—When note reset is off, the oscillators are free running, which is typically how analog synths behave. That is, the oscillators are running whether a note is being gated on (played) or not. When the amplifier envelope is set for a fast attack, this can cause a soft, but detectable, pop or click at the beginning of a note because the note might be gated on at a point in the wave's cycle other than a zero crossing. The first cycle to play might be truncated. For some sounds, like monophonic basses, this may actually be desirable. It adds a bit of randomness to the attack that can make it sound more organic. When note reset is on, the wave is always reset to zero — the start of its cycle — when a note is gated on.

Osc 2 Note Reset: Off, On—See the explanation above.

Osc 1 Key On/Off: Off, On—When on, the oscillator is controlled by the keyboard or note data received via MIDI. When off, the oscillator plays at its base frequency setting and its pitch doesn't change when you play notes on the keyboard (although its pitch may be affected by modulation from other sources).

Osc 2 Key On/Off: Off, On—See the explanation above.

Pan Mod Mode: Alternate,Fixed—Designates the behavior of panning when Pan is used as a modulation destination. Choosing ALTERNATE directs modulation to the Pan Spread parameter, and thereby affects the panning width of individual voices within a program. Choosing FIXED directs modulation to panning for the entire program.(In this case you should set Pan Spread to zero.) For example, if you choose Mod Wheel as a source and Pan as a destination in the mod matrix with an Amount setting of 127, pushing the Mod Wheel to its full (top) position will pan the sound hard right. An Amount of -127 will pan the sound hard left when you push the Mod Wheel to its top position.

Glide Mode: Fixed Rate,Fixed Rate A,Fixed Time, Fixed Time A—Sets the way the oscillators respond to Glide settings. See "Glide" on page page 56 for more details.

Osc 1 Glide: 1...127—While the glide RATE knobs sets the same amount of glide for both oscillators simultaneously, you can use the OSC GLIDE 1 parameter to set an individual glide amount for Oscillator 1.

Osc 2 Glide: 1...127—While the glide RATE knobs sets the same amount of glide for both oscillators simultaneously, you can use the OSC GLIDE 2 parameter to set an individual glide amount for Oscillator 2.

Pitchbend Range: 1...12—Sets the bend range, in semitones, of the pitch wheel. The setting is the range in the positive or negative direction. For example, a setting of 7 lets you bend a note up or down by a fifth.

Unison Mode: 1...16, Chord—Sets the number of voices stacked when UNISON is enabled. Choosing CHORD, enables chord memory. See "Unison" on page 51 for more details.

Unison Detune: 0…16—When UNISON is enabled, UNISON DETUNE allows you to detune the unison voices by a variable amount.

Key Mode: Low, Hi,Last, LowR, HiR, LastR—Sometimes called "note priority," this determines what note has priority when more than one note is played on the keyboard or via MIDI when UNISON mode is enabled:

- Low-Note Priority is most common in vintage synths and is often used for playing trills by holding a note and repeatedly tapping a lower note.

- Low Retrigger causes the envelopes to be retriggered with each keystroke.

- High Note and High Retrigger are similar to the low note settings, except that the highest note is given priority.

- Last Note and Last Retrigger give priority to the last note played.

Env 3 Repeat: Off, On—When on, the Delay, Attack, and Decay segments of the envelope repeat. Sustain still affects the level at which the Decay segment ends, but instead of sustaining at a fixed level while a note is gated on, Delay, Attack, and Decay loop until the note is turned off. The Release segment begins when the note is gated off, just as it does when Repeat is off.

VCA Level: 1...127—Sets a base level for the VCA (Voltage Controlled Amplifier). This allows the VCA to be bypassed for programs that drone.

If VCA LEVEL is on full, Envelope Amount has no effect. For typical keyboard playing, VCA LEVEL is set to zero.

Split Point: C-2...C8—Sets the split point for Layer B in Split A|B mode. In split mode, playing a key on the left side of the keyboard will play the Layer A sound and playing a key on the right side will play the Layer B sound. Polyphony is allocated equally between the two sounds, half of the available voices on Layer A and half on Layer B. The split point is saved with the program.

Exporting Programs and Banks

You can use the PGM DUMP command in the GLOBAL menu to transmit the current program, bank, or all banks in SysEx format via the selected MIDI port. This allows you to save your programs so that you can share them or archive them. You will need a computer and software application such as SysEx Librarian for Macintosh, or MIDIOX for Windows.

To export a program or bank as a SysEx file over MIDI:

1. Connect your synthesizer to a computer using a USB cable.

2. Open your MIDI librarian software (SysEx Librarian, etc.) and configure it to receive SysEx messages.

3. Press the GLOBAL button on your synth.

4. Use the PARAMETER knob to select MIDI SYSEX CABLE, then use the VALUE knob to choose USB.

5. Use the PARAMETER knob to select DUMP PROG, DUMP BANK, or DUMP ALL BANKS, depending on which of these you would like to do.

6. Press WRITE. The program or bank is exported

Dumped programs will load back into the same bank and program location in memory when received by the Prophet Rev2 via MIDI.

Programs can also be dumped directly from one Rev2 to another using the MIDI DIN jack, if the MIDI SYSEX CABLE parameter is set to MIDI in the GLOBAL menu.

To export a program or bank as a SysEx file over MIDI:

1. Connect two Rev2 synthesizers together using MIDI cables and the MIDI IN AND MIDI OUT jacks on their rear panels.

2. Press the GLOBAL button on Rev2 that you want to send programs from.

3. On both synthesizers, use the PARAMETER knob to select MIDI SYSEX CABLE, then use the VALUE knob to choose MIDI.

4. On the Rev2 that you want to send the programs from, press the GLOBAL button (if it's not already on) and use the PARAMETER knob to select DUMP PROG, DUMP BANK, or DUMP ALL BANKS, depending on which of these you would like to do.

5. Press WRITE. The program or bank is exported to the other Rev2.

Dumped programs will load back into the same bank and program location in memory when received by the Prophet Rev2 via MIDI.

Importing Programs and Banks

You can use a MIDI librarian application such as such as SysEx Librarian for Macintosh, or MIDIOX for Windows to transmit exported program or banks back into your Prophet Rev2. You will need a computer and an appropriate software application.

The Prophet Rev2 is compatible with Prophet '08 sounds, so you can import any Prophet '08' programs and they will sound just as good, if not better!

To import a program or bank as a SysEx file over MIDI:

1. Connect your synthesizer to a computer using a USB cable (or MIDI cable, if you are using a dedicated MIDI interface).

2. Press the GLOBAL button on your Rev2.

3. Use the PARAMETER knob to select MIDI SYSEX CABLE, then use the VALUE knob to choose either USB or MIDI, depending on which port you are using to connect to your computer.

4. Open your MIDI librarian software and configure it to send SysEx messages to your synthesizer.

5. In the MIDI librarian, open the programs and/or banks you want to send.

6. Transmit the programs. The Prophet Rev2 should load them. They will replace any existing programs in those memory locations on the synth.

Programs will load back into the same bank and program locations from which they were originally exported.

Calibrating the Prophet Rev2

Because the Prophet Rev2 is calibrated at the factory, controls such as the Pitch and Mod wheels shouldn't require re-calibration. However, if for some reason you experience unexpected behavior with these controls, you can use the built-in calibration function to tune them occasionally.

Calibrating the Oscillators and Filters

To calibrate the oscillators and filters:

1. Press the GLOBAL button.

2. Use the PARAMETER knob to select CALIBRATE, then press the WRITE button.

3. The synthesizer performs its auto-calibration procedure. Don't turn off the power while it's doing this.

4. When finished, the front panel controls will return to normal and you can play the Prophet Rev2 again.

Calibrating the Pitch and Mod Wheels

To calibrate the Pitch and Mod wheels:

1. Press the GLOBAL button.

2. Use the PARAMETER knob to select CALIBRATE WHEELS, then follow the instructions in the display.

3. When finished, the front panel controls will return to normal and you can play the Prophet Rev2 again.

Resetting the Global Parameters

If you're trying to track down a problem, it's sometimes a good idea to reset the Global parameters to their defaults. This is a quick way to make sure that the Prophet Rev2 returns to its factory settings.

To reset all Global parameters to their default settings:

1. Press the GLOBAL button.

2. Use the PARAMETER knob to select RESET GLOBALS, then press WRITE.

Using USB

The Prophet Rev2's USB 2.0 port enables bidirectional MIDI communication with a computer. A MIDI interface and MIDI cables are not necessary, just a USB cable. The Prophet Rev2 is a Class Compliant USB device. That means it does not require any additional drivers to be installed to communicate with a Mac or Windows computer. The Prophet Rev2 transmits and receives MIDI data via USB, but does not transmit audio.

MIDI In and USB should not be used at the same time, as overlapping messages from different sources may cause the Prophet Rev2 to respond unpredictably. MIDI Out and USB can be used at the same time and transmit the same data.

USB Notes

Under Mac OS X, "Prophet Rev2 Keyboard" will appear as a MIDI port when connected via USB and can be configured using the Mac's Audio MIDI Setup utility (typically found in Applications/Utilities).

Under Windows, the first time the Prophet Rev2 is connected via USB, the "Found new hardware" alert appears and it is automatically installed as "Prophet Rev2 Keyboard."

In Windows, if you unplug the USB cable and plug it back in while a program has the Prophet Rev2 port open, you may have to resync. That usually means going to the Prophet Rev2 Keyboard Properties — in the Windows Device Manager under "Sound, video, and game controllers" — and clicking OK. If *Prophet Rev2 Keyboard* is no longer listed in the Device Manager, power the Prophet Rev2 down and back up again while it is connected via USB. It should be detected on power up.

Appendix A: Modulation Sources

Off
Seq 1
Seq 2
Seq 3
Seq 4
LFO 1
LFO 2
LFO 3
LFO 4
Env LPF
Env VCA
Env 3
Pitchbend
Mod Wheel
Pressure
Breath
Foot Pedal
Expression Pedal
Velocity
Note Number
Noise
DC
Audio Out *

* Audio Out is the digitized audio signal after the
Amplifier VCA.

Appendix B: Modulation Destinations

Off	VCA Attack
Osc 1 Freq	Env 3 Attack
Osc 2 Freq	Env All Attack
Osc All Freq	LPF Decay
Osc 1 Level	VCA Decay
Osc Mix	Env 3 Decay
Noise Level	Env All Decay
Sub Osc Level	LPF Release
Osc 1 Shape	VCA Release
Osc 2 Shape	Env 3 Release
Osc All Shape	Env All Release
Filter Cutoff	Mod 1 Amount
Filter Resonance	Mod 2 Amount
Filter Audio Mod	Mod 3 Amount
VCA	Mod 4 Amount
Pan	Mod 5 Amount
LFO 1 Freq	Mod 6 Amount
LFO 2 Freq	Mod 7 Amount
LFO 3 Freq	Mod 8 Amount
LFO 4 Freq	Osc Slop
LFO All Freq	FX Mix
LFO 1 Amount	FX Param 1
LFO 2 Amount	FX Param 2
LFO 3 Amount	
LFO 4 Amount	
LFO All Amount	
LP Filter Env Amount	
Amp Env Amount	
Env 3 Amount	
Env All Amount	
LPF Attack	

Appendix C: Alternative Tunings

By default, the Prophet Rev2 is set to standard, chromatic western tuning. Additionally, it supports up to 16 additional alternative tunings, which you can access using the ALT TUNINGS parameter in the GLOBAL menu.

From the factory, the Prophet Rev2 ships with 16 preset alternative tunings ranging from Equal temperament to Indonesian Gamelan tunings. If you want, you can replace these with other tunings that you can find on the Internet. These must be in SysEx format. You can download them into the Prophet Rev2 using SysEx Librarian for Mac or MIDI-OX for Windows.

Here are descriptions of the default alternative tunings:

1. 12-Tone Equal Temperament (non-erasable)
The default Western tuning, based on the twelfth root of two.

2. Harmonic Series
MIDI notes 36-95 reflect harmonics 2 through 60 based on the fundamental of A = 27.5 Hz. The low C on a standard 5 octave keyboard acts as the root note (55Hz), and the harmonics play upwards from there. The remaining keys above and below the 5 octave range are filled with the same intervals as Carlos' Harmonic 12 Tone that follows.

3. Carlos Harmonic Twelve Tone
Wendy Carlos' twelve note scale based on octave-repeating harmonics. A = 1/1 (440 Hz). 1/1 17/16 9/8 19/16 5/4 21/16 11/8 3/2 13/8 27/16 7/4 15/8

4. Meantone Temperament
An early tempered tuning, with better thirds than 12ET. Sounds best in the key of C. Use this to add an authentic touch to performances of early Baroque music. C=1/1 (260 Hz)

5. 1/4 Tone Equal Temperament

24 notes per octave, equally spaced 24root2 intervals. Mexican composer Julian Carillo used this for custom-built pianos in the early 20th century.

6. 19 Tone Equal Temperament

19 notes per octave (19root2) offering better thirds than 12 ET, a better overall compromise if you can figure out the keyboard patterns.

7. 31 Tone Equal Temperament

Many people consider 31root2 to offer the best compromise towards just intonation in an equal temperament, but it can get very tricky to keep track of the intervals.

8. Pythagorean C

One of the earliest tuning systems known from history, the Pythagorean scale is constructed from an upward series of pure fifths (3/2) transposed down into a single octave. The tuning works well for monophonic melodies against fifth drones, but has a very narrow palate of good chords to choose from. C=1/1 (261.625 Hz)

1/1 256/243 9/8 32/27 81/64 4/3 729/512 3/2 128/81 27/16 16/9 243/128

9. Just Intonation in A with 7-Limit Tritone at D#

A rather vanilla 5-limit small interval JI, except for a single 7/5 tritone at D#, which offers some nice possibilities for rotating around bluesy sevenths. A=1/1 (440 Hz) 1/1 16/15 9/8 6/5 5/4 7/5 3/2 8/5 5/3 9/5 15/8

10. 3-5 Lattice in A

A pure 3 and 5-limit tuning which resolves to very symmetrical derived relationships between notes. A=1/1 (440 Hz)

1/1 16/15 10/9 6/5 5/4 4/3 64/45 3/2 8/5 5/3 16/9 15/8

11. 3-7 Lattice in A

A pure 3 and 7-limit tuning which resolves to very symmetrical derived relationships between notes. Some of the intervals are very close together, offering several choices for the same nominal chords. A=1/1 (440 Hz)

1/1 9/8 8/7 7/6 9/7 21/16 4/3 3/2 32/21 12/7 7/4 63/32

12. Other Music 7-Limit Black Keys in C

Created by the group Other Music for their homemade gamelan, this offers a wide range of interesting chords and modes. C=1/1 (261.625 Hz)

1/1 15/14 9/8 7/6 5/4 4/3 7/5 3/2 14/9 5/3 7/4 15/8

13. Dan Schmidt Pelog/Slendro

Created for the Berkeley Gamelan group, this tuning fits an Indonesian-style heptatonic Pelog on the white keys and pentatonic Slendro on the black keys, with B and Bb acting as 1/1 for their respective modes. Note that some of the notes will have the same frequency. By tuning the 1/1 to 60 Hz, Dan found a creative way to incorporate the inevitable line hum into his scale. Bb, B = 1/1 (60 Hz)

1/1 1/1 9/8 7/6 5/4 4/3 11/8 3/2 3/2 7/4 7/4 15/8

14. Yamaha Just Major C

When Yamaha decided to put preset microtunings into their FM synth product line, they selected this and the following tuning as representative just intonations. As such, they became the de-facto introduction to JI for many people. Just Major gives preferential treatment to major thirds on the sharps, and a good fourth relative to the second. C= 1/1 (261.625)

1/1 16/15 9/8 6/5 5/4 4/3 45/32 3/2 8/5 5/3 16/9 15/8

15. Yamaha Just Minor C

Similar to Yamaha's preset Just Major, the Just Minor gives preferential treatment to minor thirds on the sharps, and has a good fifth relative to the second. C= 1/1 (261.625) 1/1 25/24 10/9 6/5 5/4 4/3 45/32 3/2 8/5 5/3 16/9 15/8

16. Harry Partch 11-Limit 43 Note Just Intonation

One of the pioneers of modern microtonal composition, Partch built a unique orchestra with this tuning during the first half of the 20th century, to perform his own compositions. The large number of intervals in this very dense scale offers a full vocabulary of expressive chords and complex key changes. The narrow spacing also allows fixed-pitched instruments like marimbas and organs to perform glissando-like passages. G = 1/1 (392 Hz, MIDI note 67)

1/1 81/80 33/32 21/20 16/15 12/11 11/10 10/9 9/8 8/7 7/6 32/27 6/5 11/9 5/4 14/11 9/7 21/16 4/3 27/20 11/8 7/5 10/7 16/11 40/27 3/2 32/21 14/9 11/7 8/5 18/11 5/3 27/16 12/7 7/4 16/9 9/5 20/11 11/6 15/8 40/21 64/33 160/81

17. Arabic 12-Tone

A 12-tone approximation of an Arabic scale, which appears in some electronic keyboards designed for use with Arabic music. Not a JI scale, nor equal tempered. These are the intervals in Cents relative to C:

60 = Cents 0

61 = Cents +151

62 = Cents +204

63 = Cents +294

64 = Cents +355

65 = Cents +498

66 = Cents +649

67 = Cents +702

68 = Cents +853

69 = Cents +906

70 = Cents +996

71 = Cents +1057

72 = Cents +1200

Appendix D: Troubleshooting and Support

Troubleshooting

If you're experiencing problems or unexpected behavior from your Prophet Rev2, here are a few typical scenarios and their solutions:

If the Prophet Rev2 isn't producing sound:.

1. Initialize a basic preset by holding the Transpose DOWN and UP buttons and pressing the HOLD button.

2. If the problem is still there, check the following:

- Master Volume - make sure it is set to an appropriate value

- Rear-panel output jacks - make your audio cables are connected to MAIN/A OUTPUT.

- In the GLOBAL menu, make sure that LOCAL CONTROL is set to ON.

If the sequencer or arpeggiator has stopped running:

- Check the MIDI CLOCK MODE setting in GLOBAL to ensure the Prophet Rev2 is set to MASTER or OFF. Or if set to SLAVE or SLAVE THRU or SLAVE NO S/S, make sure the Prophet Rev2 is receiving MIDI clock.

If some of the programs sound different than usual:

- In the Global menu, check ALT TUNINGS and make sure it's set to EQUAL TEMPERAMENT. Also, check the mod wheel position. The mod wheel can do more than just add vibrato. Also, check the MIDI CLOCK MODE setting in the GLOBAL menu to ensure the Prophet Rev2 is set to MASTER or OFF. Or if set to SLAVE or SLAVE THRU or SLAVE NO S/S, make sure the Prophet Rev2 is receiving MIDI clock.

If there is a ground hum in the audio output:

- USB can cause ground loops, so try to resolve any grounding issues between the computer and the Prophet Rev2. Or use MIDI, which is opto-isolated.

If the Prophet Rev2 is behaving erratically.

• This is almost always caused by a MIDI data loop. Make sure that any MIDI Thru functionality is turned off on the MIDI interface/hardware or in the MIDI software application. Disconnect all the Prophet Rev2's MIDI connections—MIDI and USB cables—and see if the problem persists. You can also monitor the MIDI traffic with *MIDI Monitor* (Mac OS) or *MIDI-OX* (Windows) to see if the Prophet Rev2 is being overrun with duplicate messages.

If the Prophet Rev2 doesn't seem to respond to its controls:

• Make sure LOCAL CONTROL is ON in the GLOBAL menu.

If MIDI System Exclusive data is not transmitted/received:

• Make sure that the MIDI SYSEX CABLE setting in the GLOBAL menu is set to USB or MIDI depending on which you are using to transmit or receive MIDI messages.

If the Prophet Rev2 plays out of tune:

• Check the MASTER COARSE and MASTER FINE parameter in the GLOBAL menu. If they seem correct, you may need to retune the oscillators. See "Calibrating the Oscillators and Filters" on page 66.

If the pitch or mod wheel doesn't go to full range:

• Recalibrate the pitch and mod wheels. See "Calibrating the Pitch and Mod Wheels" on page 66.

If the filter sounds strange or out of tune:

• You may need to retune the filters. See "Calibrating the Oscillators and Filters" on page 66.

If the OS fails to load correctly when you update:

- The Prophet Rev2 is equipped with a MIDI bootloader, which will allow you to reload the OS in the event you accidentally "brick" your synth (permanently freeze it) while updating its OS.

To restore your Prophet Rev2 if it is frozen.

1. Power on the Prophet Rev2 while holding the GLIDE switch to enter bootloader mode. You'll see a message in the display.

2. Use a MIDI cable (not USB) to transmit the new OS to your synth. You must use a standard MIDI cable for this. USB MIDI doesn't work in bootloader mode.

3. As the OS loads, you will see the main display count upward from zero to 99. When it reaches 99, a second count will begin. Do not power down. The Prophet Rev2 will restart itself when it is done.

Contacting Technical Support

If you are still having a problem with the Prophet Rev2, contact Technical Support at support@davesmithinstruments.com. Please include your Prophet Rev2's serial number, the version of the operating system (displayed when the Global button/menu is enabled), and the purchase date.

If you have not already reset the Global parameters and run the calibration routines (see Troubleshooting), you should do it before contacting Technical Support. It's probably the first thing they'll ask you to do.

Warranty Repair

Dave Smith Instruments warrants that the Prophet Rev2 will be free from defects in materials and/or workmanship for 1 year from the date of purchase. Please register your product online at www. davesmithinstruments.com to establish the date of purchase. (This is not a requirement for warranty service, but it will help expedite the process.)

Please contact support@davesmithinstruments.com to determine the best course of action for getting your Prophet Rev2 repaired. For your own protection, as well as ours, please do not return any product to Dave Smith Instruments without a return authorization (RA) number. To issue an RA number, Technical Support needs:

• Your name
• Your return address
• Your email address
• A phone number where you can be reached
• Your Prophet Rev2's serial number
• The date of purchase and where purchased

If you need to return your instrument for repair, you are responsible for getting it to DSI. We highly recommend insuring it and packing in the original packaging. Damage resulting from shipping a product with insufficient packaging is not covered by warranty.

Appendix E: MIDI Implementation

The Prophet Rev2 receives MIDI data according to the settings you have chosen in GLOBALS. In addition, there is interaction between some of the program parameters that determine the overall response of Prophet Rev2 to MIDI data. Following are the GLOBALS parameters that affect response to MIDI:

MIDI Channel: All, 1…16—Selects which MIDI channel to send and receive data, 1 to 16. All receives on all 16 channels.

MIDI Clock Mode: Sets the Prophet Rev2's ability to send and receive MIDI clock messages:

- Off: MIDI Clock is neither sent nor received

- Master: MIDI Clock is sent, but not received

- Slave: MIDI Clock is received, but not sent

- Slave Thru: MIDI Clock is received and passed to MIDI Out

- Slave No S/S (no start and stop): Receives MIDI Clock but does not respond to MIDI Start or Stop command.

> When set to SLAVE or SLAVE THRU, if no MIDI clock is present at the selected input, the arpeggiator and sequencer will not function.

MIDI Clock Cable: MIDI Port, USB—Sets the port, MIDI or USB, by which MIDI clock signals are received.

MIDI Param Send: Off, CC, NRPN—Changes to the values of front panel controls are transmitted via MIDI as Continuous Controllers (CC) or Non-Registered Parameter Number (NRPN). Transmission of parameters can also be turned off.

> NRPNs are the preferred method of parameter transmission, since they cover the complete range of all parameters, while CCs are limited to a range of 128.

Param Rcv: Off, CC, NRPN—Sets the method by which parameter changes are received via MIDI. As with transmission, NRPNs are the preferred method.

MIDI Prog Enable: Off, On—When set to On, the synth will respond to MIDI controllers, including pitch wheel, mod wheel, pedal, and volume.

MIDI SysEx Cable: MIDI, USB—When set to MIDI it will receive and transmit them using the MIDI ports/cables When set to USB it will receive and transmit them using the USB port/cable. MIDI SysEx messages are used when sending and receiving a variety of data including, programs, alternative tunings, system updates, and more.

MIDI Out Select: MIDI, USB—Sets the port by which MIDI data will be transmitted.

MIDI Messages

System Real-Time Messages

Status	Description
1111 1000	MIDI Timing Clock

Received Channel Messages

Status	Second	Third	Description
1000 nnnn	0kkkkkkk	0vvvvvvv	Note Off. Velocity is ignored
1001 nnnn	0kkkkkkk	0vvvvvvv	Note On. Note off if vvvvvvv = 0
1010 nnnn	0kkkkkkk	0vvvvvvv	Polyphonic Key Pressure
1011 nnnn	0vvvvvvv	0vvvvvvv	Control Change; see "Received Controller Messages"
1100 nnnn	0ppppppp		Program change, 0-127 for Programs 1-127 within current Bank
1101 nnnn	0vvvvvvv		Channel Pressure
1110 nnnn	0vvvvvvv	0vvvvvvv	Pitch Bend LS Byte then MS Byte

Notes: 0kkkkkkk   Note number 0 — 127
       nnnn   Channel number 0 to 15 (MIDI channel 1-16).
                   Ignored if MIDI channel set to ALL
      0vvvvvvv   Value

Received Controller Messages

Status	Second	Third	Description
1011 nnnn	0000 0001	0vvvvvvv	Mod Wheel: directly assignable controller
1011 nnnn	0000 0100	0vvvvvvv	Foot Controller: directly assignable controller
1011 nnnn	0000 0111	0vvvvvvv	Volume: Combined with Master Volume and Program Volume
1011 nnnn	0100 1010	0vvvvvvv	Brightness: Added to filter cutoff frequency
1011 nnnn	0010 0000	0vvvvvvv	Bank Select: 1 - 4 select user banks 1 - 4; 5 - 8 select factory banks 1 - 4; others ignored
1011 nnnn	0100 0000	0vvvvvvv	Damper pedal: Holds envelopes in Sustain if 0100 0000 or higher
1011 nnnn	0111 1011	0vvvvvvv	All Notes Off: Clear all MIDI notes
1011 nnnn	0111 1001	0vvvvvvv	Reset All Controllers: Clears all MIDI controllers to 0, MIDI volume to maximum

See sections below for additional Continuous Controller (CC) and Non-Registered Parameter Number (NRPN) messages received.

Transmitted Channel Messages

Status	Second	Third	Description
1000 nnnn	0kkkkkkk	0000000	Note Off.
1001 nnnn	0kkkkkkk	0vvvvvvv	Note On.
1011 nnnn	0vvvvvvv	0vvvvvvv	Control Change; see "Transmitted Controller Messages"
1100 nnnn	0ppppppp		Program change, 0-127 for Programs 00-128 within current Bank
1101 nnnn	0vvvvvvv		Channel Pressure
1110 nnnn	0vvvvvvv	0vvvvvvv	Pitch Bend LS Byte then MS Byte

Notes: 0kkkkkkk   Note number 0 — 127
    nnnn   Channel number 0 to 15 (MIDI channel 1-16).
            Ignored if MIDI channel set to ALL
    0vvvvvvv   Value

Transmitted Controller Messages

Status	Second	Third	Description
1011 nnnn	0000 0001	0vvvvvvv	Mod Wheel
1011 nnnn	0100 1010	0vvvvvvv	Brightness: Assigned to Penal/CV
1011 nnnn	0010 0000	0vvvvvvv	Bank Select: 0 - 9
1011 nnnn	0100 0000	0vvvvvvv	Damper pedal: Sends 0 if off, 0111
1011 nnnn	0000 0111	0vvvvvvv	Volume knob

See sections that follow for additional Continuous Controller (CC) and Non-Registered Parameter Number (NRPN) messages transmitted.

Additional Continuous Controllers Transmitted/Received

The following table details how MIDI Continuous Controllers (CCs) are mapped to Rev2 controls. They are transmitted when Param Xmit is set to CC, and recognized/received when MIDI Rcv Receive is set to CC.

CC#	Param		CC#	Param
1	Mod Wheel		39	Split Point
3	FX Type		64	Sustain Pedal
5	Glide Mode		65	Glide On/Off
7	Master Volume		75	Amp Sustain
8	Sub Oscillator		76	Amp Release
9	Osc. Slop		77	Env 3 Sustain
10	Pan Mod Mode		78	Env 3 Release
12	FX Param 1		85	Env 3 Destination
13	FX Param 2		86	Env 3 Amount
14	BPM		87	Env 3 Velocity
15	Clock Divide		88	Env 3 Delay
16	FX On/Off		89	Env 3 Attack
17	FX Mix		90	Env 3 Decay
18	A/B Mode		102	Filter Frequency
19	Sequencer Type		103	Resonance
20	Osc 1 Frequency		104	Filter Key Amount
21	Osc 1 Fine Tune		105	Filter Audio Mod
22	Osc 1 Shape		106	Filter Env. Amount
23	Osc 1 Glide Rate/Time		107	Filter Env. Velocity
24	Osc 2 Frequency		108	Filter Delay
25	Osc 2 Fine Tune		109	Filter Attack
26	Osc 2 Shape		110	Filter Decay
27	Osc 2 Glide Rate/Time		111	Filter Sustain
28	Osc Mix		112	Filter Release
29	Noise Level		113	VCA Level
30	Osc 1 Shape Mod		114	Pan Spread
31	Osc 2 Shape Mod		115	Amp Env. Amount
33	Arp On/Off		116	Amp Env. Velocity
34	Arp Mode		117	Amp Delay
35	Arp Range		118	Amp Attack
36	Arp Repeats		119	Amp Decay
37	Voice Volume			

NRPN Messages

The Non-Registered Parameter Number (NRPN) MIDI messages are used to transmit and receive both global and program parameters. They are transmitted when MIDI Parameter Send is set to NRPN in GLOBALS, and received when MIDI Parameter Receive is set to NRPN in GLOBALS.

The messages are handled in standard MIDI format using the NRPN CC commands in running status byte format. Below is the format used for transmitting a NRPN parameter.

Transmitted NRPN Messages

Status	Description
1011 nnnn	Control Change
0110 0011	NRPN parameter number MSB CC
0vvv vvvv	Parameter Number MSB
0110 0010	NRPN parameter number LSB CC
0vvv vvvv	Parameter Number LSB
0000 0110	NRPN parameter value MSB CC
0vvv vvvv	Parameter value MSB
0010 0110	NRPN parameter value LSB CC
0vvv vvvv	Parameter value LSB

The parameter number can be found in the two tables below, one for global parameters, and the other for program parameters. The parameter numbers and the parameter values are broken into two 7-bit bytes for MIDI transmission; the LSB has the seven least-significant bits, and the MSB has the seven most-significant bits, though in most cases the MSB will be zero or one, and never more than two.

When receiving an NRPN, all messages do not necessarily need to be transmitted, since the synth will track the most recent NRPN number, though it is usually good practice to send the entire message above.

Once an NRPN is selected, the synth will also respond to NRPN Data Increment and Decrement commands, which some controllers utilize. Finally, it responds to one RPN (Registered Parameter Number) command, the RPN/NRPN Reset command, which can be handy for resetting the currently selected parameter to a known state.

Received NRPN Messages

Status	Second	Third	Description
1011 nnnn	0110 0011	0vvvvvvv	NRPN parameter number MSB CC
1011 nnnn	0110 0010	0vvvvvvv	NRPN parameter number LSB CC
1011 nnnn	0000 0110	0vvvvvvv	NRPN parameter value MSB CC
1011 nnnn	0010 0110	0vvvvvvv	NRPN parameter value LSB CC
1011 nnnn	0110 0000	0xxxxxxx	NRPN parameter value Increment
1011 nnnn	0110 0001	0xxxxxxx	NRPN parameter value Decrement
1011 nnnn	0010 0101	0111111	RPN parameter number MSB CC - Reset NRPN parameter number (when both MSB and LSB received)
1011 nnnn	0010 0100	0111111	RPN parameter number LSB CC - Reset NRPN parameter number (when both MSB and LSB received)

Global Parameter Data

The table shows the global data sent and received on global parameter dumps, and corresponding NRPN number when sent/received individually.

NRPN	Range	Description
4097	0-100	Master Coarse Tune
4096	0-24	Master Fine Tune
4098	0-16	MIDI Channel 0 = All
4099	0-3	MIDI Clock Mode 0 = Off 1 = Master 2 = Slave 3 = Slave Thru
4100	0-1	MIDI Clock Cable 0 = MIDI Port 1 = USB
4101	0-2	MIDI Param Send* 0 = NRPN 1 = CC 2= Off
4102	0-2	MIDI Param Receive† 0 = NRPN 1 = CC 2= Off
4103	0-1	MIDI Control Enable 0 = Off 1 = On
4104	0-1	MIDI SysEx Cable 0 = MIDI 1 = USB
4105	0-3	MIDI Out Select 0 = Off 1 = MIDI 2 = USB 3 = MIDI+USB
4107	0-1	Local Control* 0 = Off 1 = On
4109	0-2	Pot Mode 0 = Relative 1= PassThru 2 = Jump
4111	0-3	Seq Pedal Mode 0 = normal 1= trigger 2= gate 3= trigger+gate

NRPN	Range	Description
4112	0-3	Sustain Polarity 0 = normally open 1= normally closed 2= Sustain Normally Open/ Sequencer Normally Closed 3= Sustain Normally Closed/ Sequencer Normally Open
4113	0-3	Velocity Curve
4114	0-3	Pressure Curve
4115	0-1	Mono/Stereo Mono/Stereo 0 = Stereo 1 = Mono
4116	0-16	Alt. Tunings
4118	0-1	MIDI Prog Enable 0 = Off 1 = On
4119	0-1	Multi Mode 0 = Off 1 = On
4120	0-1	Screen Saver 0 = Off 1 = On
4121	0-1	Sustain/Arp
4190	0-1	Layer A/B Switch

*Controller received, but not transmitted.
†Controller transmitted, but ignored when received.

Program Parameter Data

The following table lists Rev2's program parameters.

NRPN	Value	Description
0	0-120	Osc 1 Freq
1	0-100	Osc 1 Freq Fine
2	0-4	Osc 1 Shape
3	0-127	Osc 1 Glide
4	0-1	Osc. 1 KBD on/off
5	0-120	Osc 2 Freq
6	0-100	Osc 2 Freq Fine
7	0-4	Osc 2 Shape
8	0-127	Osc 2 Glide
10	0-1	Sync On/Off
11	0-3	Glide Mode
12	0-127	Slop
13	0-127	Osc Mix
14	0-127	Noise
15	0-164	Filter Cutoff
16	0-127	Filter Resonance
17	0-127	Keyboard Tracking
18	0-127	Audio Mod
19	0-1	2 pole/4 pole mode
20	0-254	Filter Envelope Amt
21	0-127	Filter Envelope Vel
22	0-127	Filter Envelope Dly
23	0-127	Filt Env Attack
24	0-127	Filt Env Decay
25	0-127	Filt Env Sustain
26	0-127	Filt Env Release
28	0-127	Pan Spread
29	0-127	Voice Volume
30	0-127	VCA Env Amt
31	0-127	VCA Env Vel
32	0-127	VCA Env Delay
33	0-127	VCA Env Attack

NRPN	Value	Description
34	0-127	VCA Env Decay
35	0-127	VCA Env Sustain
36	0-127	VCA Env Release
37	0-127	VCA Env Release
38	0-127	LFO 1 Shape
39	0-127	LFO 1 Amount
40	0-52	LFO 1 Destination
41	0-1	LFO 1 Clock Sync
42	0-150	LFO 2 Freq
43	0-4	LFO 2 Shape
44	0-127	LFO 2 Amount
45	0-52	LFO 2 Destination
46	0-1	LFO 2 Clock Sync
47	0-150	LFO 3 Freq
48	0-4	LFO 3 Shape
49	0-127	LFO 2 Amount
50	0-52	LFO Destination
51	0-1	LFO 3 Clock Sync
52	0-150	LFO Freq
53	0-4	LFO 4 Shape
54	0-127	LFO 4 Amount
55	0-52	LFO 4 Destination
56	0-1	LFO 4 Clock Sync
57	0-52	Env 3 Destination
58	0-254	Env 3 Amount
59	0-127	Env 3 Vel
60	0-127	Env 3 Delay
61	0-127	Env 3 Attack
62	0-127	Env 3 Decay
63	0-127	Env 3 Sustain
64	0-127	Env 3 Release
65	0-22	Mod 1 Source

NRPN	Value	Description	NRPN	Value	Description
66	0-254	Mod 1 Amount	114	0-1	Pan Mode
67	0-52	Mod 1 Destination	116	0-254	Mod Wheel Amount
68	0-22	Mod 2 Source	117	0-52	Mod Wheel Dest
69	0-254	Mod 2 Amount	118	0-254	Pressure Amount
70	0-52	Mod 2 Destination	119	0-52	Pressure Dest
71	0-22	Mod 3 Source	120	0-254	Breath Amount
72	0-254	Mode 3 Amount	121	0-52	Breath Dest
73	0-52	Mode 3 Destination	122	0-254	Velocity Amount
74	0-22	Mod 4 Source	123	0-52	Velocity Dest
75	0-254	Mod 4 Amount	124	0-254	Foot Ctrl Amount
76	0-52	Mod 4 Destination	125	0-52	Foot Ctrl Dest
77	0-22	Mod 5 Source	153	0-1	FX On/Off
78	0-254	Mod 5 Amount	154	0-13	FX Select
79	0-52	Mod 5 Destination	156	0-255	FX Param 1
80	0-22	Mod 6 Source	157	0-127	FX Param 2
81	0-254	Mod 6 Amount	158	0-1	FX Clock Sync
82	0-52	Mod 6 Destination	163	0-2	A/B Mode
83	0-22	Mod 7 Source	164	0-1	Seq Start/Stop
84	0-254	Mod 7 Amount	167	0-16	Unison Detune
85	0-52	Mod 7 Destination	168	0-1	Unison On/Off
86	0-22	Mod 8 Source	169	0-16	Unison Mode
87	0-254	Mod 8 Amount	170		Keyboard Mode
88	0-52	Mod 8 Destination	171	0-120	Split Point
97	0-1	Env 3 Rept On/Off	172	0-1	Arp On/Off
99	0-1	Osc 1 Note Reset	173	0-4	Arp Mode
102	0-99	Osc 1 Pulse Width	174	0-2	Arp Octave
103	0-99	Osc 2 Pulse Width	175	0-12	Clock Divide
104	0-1	Osc 2 Note Reset	177	0-3	Arp Repeats
105	0-1	LFO 1 Key Sync	178	0-1	Arp Relatch
106	0-1	LFO 2 Key Sync	179	30-250	BPM Tempo
107	0-1	LFO 3 Key Sync	182	0-4	Gated Seq Mode
108	0-1	LFO 4 Key Sync	183	0-1	Gated Seq On/Off
111	0-1	Glide On/Off	184	0-52	Seq 1 Destination
113	0-12	Pitch Bend Range	185	0-53 (slew)	Seq 2 Destination

NRPN	Value	Description
186	0-52	Seq 3 Destination
187	0-53 (slew)	Seq 4 Destination
192-207	0-127	Gated Seq Track 1 Step 1-16
208-223	0-127	Gated Seq Track 2 Step 1-16
224-239	0-127	Gated Seq Track 3 Step 1-16
240-255	0-127	Gated Seq Track 4 Step 1-16
276-339	0-127	Seq Step 1-64 Note 1
340-403	128-255	Seq Step 1-64 Velocity 1
404-467	0-127	Seq Step 1-64 Note 2
468-531	128-255	Seq Step 1-64 Velocity 2
532-595	0-127	Seq Step 1-64 Note 3
596-659	128-255	Seq Step 1-64 Velocity 3
660-723	0-127	Seq Step 1-64 Note 4
724-787	128-255	Seq Step 1-64 Velocity 4
788-851	0-127	Seq Step 1-64 Note 5
852-915	128-255	Seq Step 1-64 Velocity 5
916-979	0-127	Seq Step 1-64 Note 6
980-1043	128-255	Seq Step 1-64 Velocity 6

Control NRPN Data

The following table lists the Rev2's control NRPN data. It is received and transmitted but not saved as part of a program.

NRPN	Value	Description
1088	0-1	Seq Play/Stop
16383	0-1	Seq Rec On/Off

SysEx Messages

Universal System Exclusive Message (Device Inquiry)

Status	Description
1111 0000	System Exclusive (SysEx)
0111 1110	Non-realtime message
0vvv vvvv	If MIDI channel is set to 1 - 16, 0vvvvvvv must match (unless MIDI Channel = ALL); always responds if 0vvvvvvv = 0111 1111.
0000 0110	Inquiry Message
0000 0001	Inquiry Request
1111 0111	End of Exclusive (EOX)

The Rev2 responds with:

Status	Description
1111 0000	System Exclusive (SysEx)
0111 1110	Non-realtime message
0vvv vvvv	If MIDI Channel = ALL, 0vvvvvvv = 0111 1111. Otherwise 0vvvvvvv = Channel Number 0 - 15.
0000 0110	Inquiry Message
0000 0010	Inquiry Reply
0000 0001	DSI ID
0010 1111	Rev2 ID (Family LS)
0000 0001	Family MS
0000 0000	Family Member LS
0000 0000	Family Member MS
0jjj nnnn	Main Software version: jjj - Minor rev; nnnn - Major rev
1111 0111	End of Exclusive (EOX)

Request Program Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 1111	Rev2 ID
0000 0101	Request Program Transmit
0000 00vv	Bank Number, 0 - 9
0vvv vvvv	Program Number, 0 - 99
1111 0111	End of Exclusive (EOX)

The Rev2 will respond by sending out the program data in the format described below in *Program Data Dump*.

Request Program Edit Buffer Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 1111	Rev2 ID
0000 0110	Request Program Edit Buffer Transmit
1111 0111	End of Exclusive (EOX)

The Rev2 will respond by sending out the current program edit buffer in the format described below in *Program Edit Buffer Data Dump*.

Request Global Parameter Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 1111	Rev2 ID
0000 1110	Request Global Parameter Transmit
1111 0111	End of Exclusive (EOX)

The Rev2 will respond by sending out the current values of the global parameters in the format described in *Global Parameters Data Dump*.

Program Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 1111	Rev2 ID
0000 0010	Program Data
0000 00vv	Bank Number: 0 - 9
0vvv vvvv	Program Number: 0 - 99
0vvv vvvv	1024 bytes expanded to 1171 MIDI bytes in "packed MS bit" format
1111 0111	End of Exclusive (EOX)

Program Edit Buffer Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 1111	Rev2 ID
0000 0011	Edit Buffer Data
0vvv vvvv	1024 bytes expanded to 1171 MIDI bytes in "packed MS bit" format
1111 0111	End of Exclusive (EOX)

Global Parameters Data Dump

Value	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 1111	Rev2 ID
0000 1111	Main Parameter Data
0vvv vvvv	50 nibbles (LS then MS) for 25 Global parameters
1111 0111	End of Exclusive (EOX)

The Global Parameters Data Dump is not recognized when received; it is only transmitted when requested. NRPN messages are used to change Globaqls.

Packed Data Format

Data is packed in 8 byte "packets", with the MS bit stripped from 7 parameter bytes, and packed into an eighth byte, which is sent at the start of the 8 byte packet.

Example:

Input Data   **Packed MIDI data**

```
1 A7 A6 A5 A4 A3 A2 A1 A0         1    00 G7 F7 E7 D7 C7 B7 A7
2 B7 B6 B5 B4 B3 B2 B1 B0         2    00 A6 A5 A4 A3 A2 A1 A0
3 C7 C6 C5 C4 C3 C2 C1 C0         3    00 B6 B5 B4 B3 B2 B1 B0
4 D7 D6 D5 D4 D3 D2 D1 D0         4    00 C6 C5 C4 C3 C2 C1 C0
5 E7 E6 E5 E4 E3 E2 E1 E0         5    00 D6 D5 D4 D3 D2 D1 D0
6 F7 F6 F5 F4 F3 F2 F1 F0         6    00 E6 E5 E4 E3 E2 E1 E0
7 G7 G6 G5 G4 G3 G2 G1 G0         7    00 F6 F5 F4 F3 F2 F1 F0
                                  8    00 G6 G5 G4 G3 G2 G1 G0
```

This explains why it takes 1171 MIDI bytes to transmit 1024 Program data bytes.

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